Chemical Age

S.C.I. MEETING IN FRANKFURT
(page 1627)

VOL. 81 No. 2094

20 June 1959

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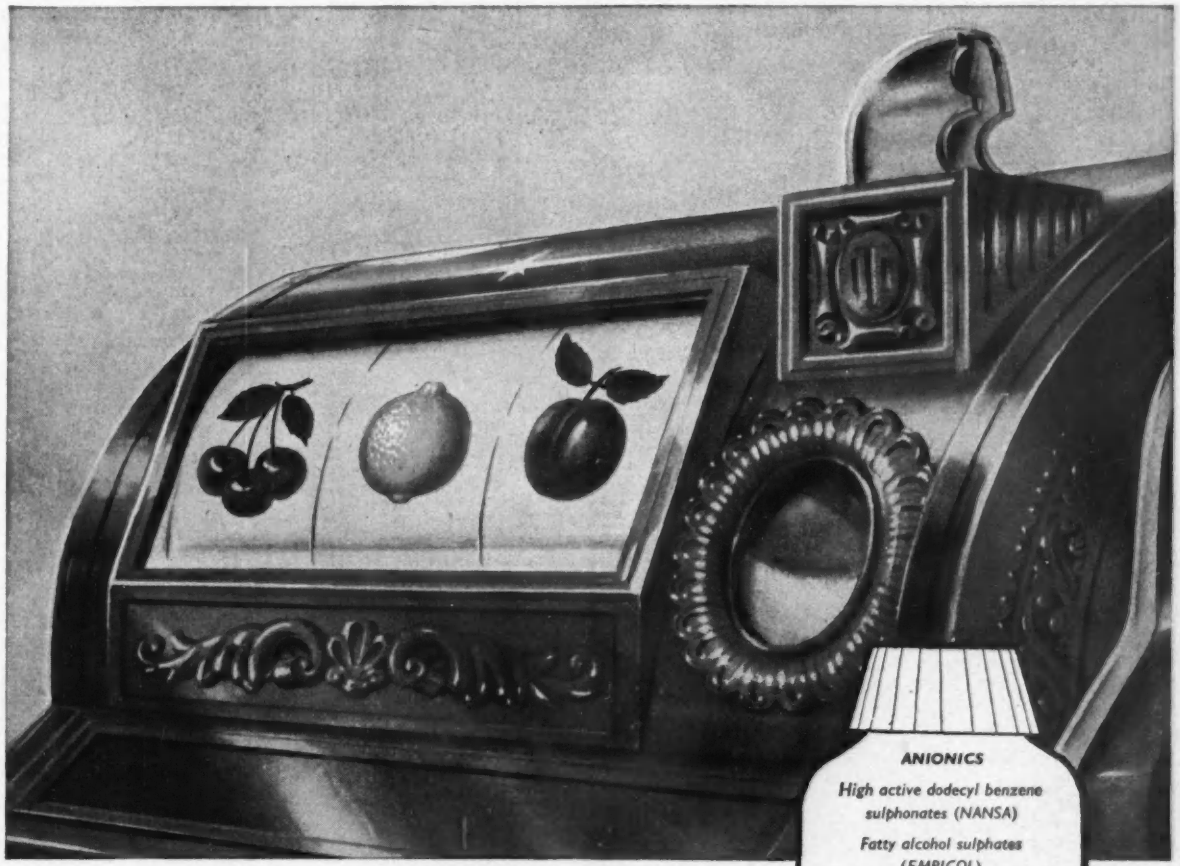

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(continued on page 1016)

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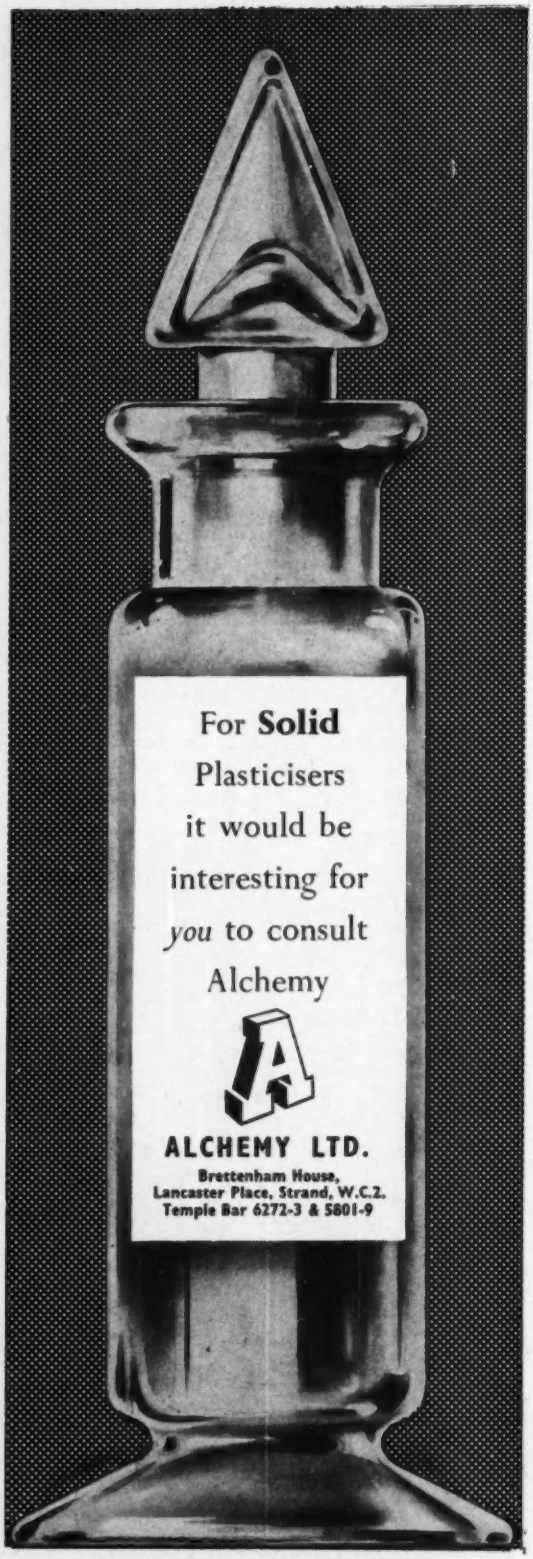

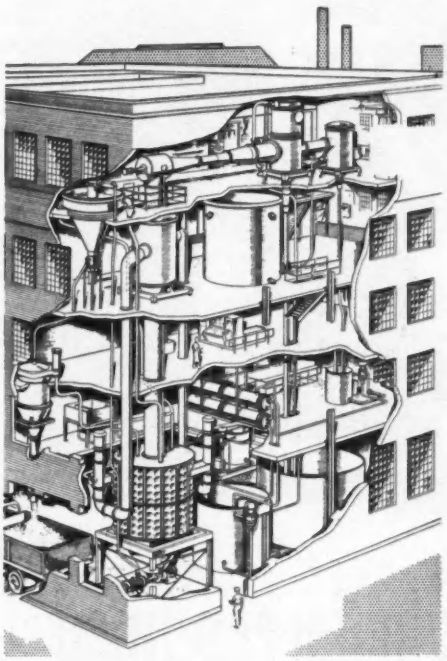

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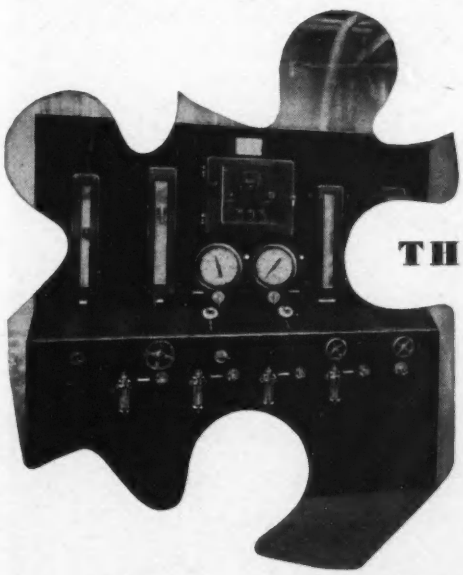

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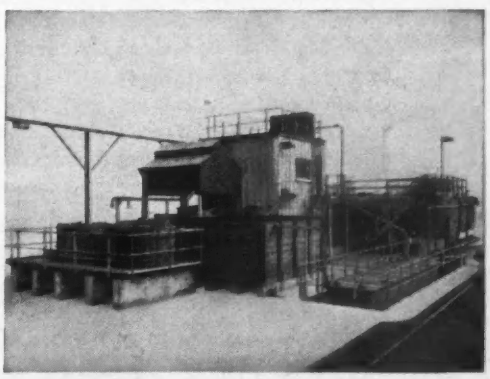

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CHEMICAL AGE

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U.K. RESEARCH ASSOCIATION

DETERMINATION not to weaken valuable incentives of U.K. research associations receiving grants from the D.S.I.R., in over-ardent pursuit of economy, is stressed by the D.S.I.R.'s Industrial Grants Committee in their annual report 'Research for Industry, 1958.' At the same time we are happy to note, the committee intends that the autonomy of research associations should be preserved and that D.S.I.R. should do all it can to strengthen the financial basis of it (see page 1030).

Another interesting point made by the committee is that research associations should be encouraged to do a "reasonable amount of sponsored research". The advantages of this would be to give the research worker in the association useful experience and strengthen the contact between the association and industry. Not least, of course, to the Government, is that payments for sponsored research add to total income and help spread the cost of research equipment. In future, therefore, a grant-aided association will not need to consult the industrial grants committee before undertaking sponsored or repayment projects unless the income arising is likely to exceed 15% of total income in any year or unless the estimated cost of any one project is over £5,000.

Today the combined annual income of the 49 grant-aided organisations is about £6.5 million including a Government grant of £1.65 million, states Dr. D. T. A. Townend, chairman of the Commitee of Directors of Research Associations. Private industry's own contribution to research and development in 1955-56—the most recent figure available—was £58 million; so that the present total income of research associations provides some indication of the important part which they now play in the national scientific effort. At the same time, it should not be forgotten that this expenditure (£58 million) represents only 0.8% of industrial output, compared with a corresponding figure of 1.9% in the U.S.

Of the estimated total of approximately £300 for national expenditure on research and development in 1955-56, £14.4 million represented research undertaken within the universities in pure science, technology, medicine and agriculture and of this total about £12 million was provided from Government funds.

While universities are mainly concerned with research of a fundamental nature the research associations seek knowledge of the basic principles of industrial processes with a particular and definite objective. Industry itself then carries through the subsequent technical developments to the production stage. Most research associations, however, find it helpful to investigate both long- and short-range objectives side by side. Indeed, D.S.I.R.'s view in this matter is that it is only by basic research that the associations will make the most effective contributions to the progress of the industries served, hence basic research as a condition of D.S.I.R. grant aid.

A recent survey of the activities of 32 research associations, Dr. Townend reports, has shown that an average proportion of about 28% of the total effort is devoted to basic research, with individual figures varying between 10% and 67%. The average proportion of effort devoted to applied research is 63%.

HIGH PURITY THORIUM

FROM C.S.I.R.O. (Commonwealth Scientific and Industrial Research Organisation of Australia) comes a report that it has developed a process for obtaining thorium of high purity. Thorium oxide used as a source material is heated to a high temperature with carbon to form thorium carbide. A small amount of iodine is added to an evacuated vessel containing the powdered or pelleted thorium carbide heated to a temperature below red heat. Volatile thorium iodide produced by reaction of thorium carbide with iodine acts as a carrier to convey thorium to another part of the vessel containing a filament heated electrically to white heat. Thorium metal deposits on the filament, gradually building up a metal rod, and iodine liberated by thermal decomposition of the iodide is made available for further reaction with thorium carbide.

Carbon, oxygen and nitrogen contents of the product are said to be as low as, or lower than, those in the best material obtained from a metal feed, while rate of growth of the product compares favourably with that obtained with thorium metal feed materials. Thus a simple and cheaper method for making pure thorium has been made available since it is no longer necessary to use expensive raw materials in the form of thorium metal of relatively low purity. Such a costly starting material has hitherto relegated the original Van Arkel-de Boer process to the role of a refining process only. A feature of the carbide-iodide process is the high degree of purification attainable. This has been investigated by radioactive tracers and theoretically by calculation of appropriate thermodynamic functions for virtually all elements.

Very considerable purification occurs during the carbide formation stage when low concentrations of some 60 elements volatilise at the high temperature required to convert thorium oxide to thorium carbide. The remaining impurities are separated at one or other of the four principal stages of the metal deposition process. Thus some impurities may be separated from the product metal because the iodide of the impurity metal is too unstable in the presence of thorium carbide or is of two low a vapour pressure to transfer the impurity to the filament. Other impurities may be separated because the iodide is too stable to be decomposed by the heated thorium filament or because the impurity metal concerned is too volatile to remain on the filament. Only uranium, zirconium, hafnium, and possibly, protoactinium transfer substantially to the product metal.

The importance of the carbide-iodide process lies in the fact that it has other applications. Thorium metal or ceramic materials containing thorium which have been irradiated in an atomic reactor can be decontaminated from fission products. Both the thermal decontamination occurring during the carbide formation stage and the greater degree of decontamination occurring at the metal growing stage may have useful applications, while the decontamination attainable in the overall process exceeds by several orders of magnitude that obtained in most current pyrometallurgical recontamination procedures.

ETHYLENE OXIDE STERILISATION

THERE appears to be considerable interest in the U.S. in the use of the ethylene oxide method of sterilising. Skating rink operators are said to be interested in sterilising rented shoe skates and swimming pools could use ethylene oxide to sterilise bathing suits. It could also be used as a decontaminant for when a container of live polio vaccine was accidentally spilled during an air flight, ethylene oxide was used as a decontaminant.

Ethylene oxide has been used extensively as an insecticide, but commercial preparations containing 10% ethylene oxide and 90% carbon dioxide for fumigant purposes have had to be packed in heavy compressed gas cylinders. Formulations have been developed for packaging in small inexpensive low or medium pressure dispensers in the U.S. The dispensed vapours alone or in any mixture with air must not propagate flame, however. Now, E. O. Haenni, and co-workers report (*Ind. and Engng. Chem.*, 1959, **51**, No. 5. 685) that solutions of ethylene oxide in dichlorodifluoromethane that contain 12% or less by weight of the oxide and solutions of ethylene oxide in a mixture of equal parts by weight of dichlorodifluoromethane and trichloromonofluoromethane that contain 10% or less by weight of oxide, are not capable of propagating flame in the vapour state either pure or mixed up with any proportions of air at temperatures up to 130°F.

These formulations contain in the vapour state up to 27 times as great a concentration of ethylene oxide as does the present commercial formulation of ethylene oxide with carbon dioxide. These ethylene oxide-chlorofluorohydrocarbon formulations are consequently much more efficient sterilising agents than the latter, and herald the prospect of widespread use for sterilisation purposes.

REMOVING ACID GASES

TO remove hydrogen sulphide and carbon dioxide from natural gas at Lacq, France, a new technique has been evolved. Water scrubbing is being used to remove the greater part of the H_2S, followed by scrubbing with monoethanolamine and a light treatment with caustic soda to remove the remainder of the acid gases. Water scrubbing means a marked saving in steam, as desorption of the water requires no heating. (See page 1032.)

This is how the new process works. The sour Lacq gas contains 13.5% H_2S and 9.6% CO_2. H_2S content is dropped to 2% and CO_2 to 8%, after the gas is scrubbed with water at 1,000 p.s.i., and atmospheric temperature. Gases dissolved in the water 'flash off' when the pressure of the water is lowered to atmospheric.

Amount of Lacq gas now being desulphurised in this way in the newly opened second section is stated to be about 75 million cu. ft./day. The first section desulphurises 110 million cu. ft./day by diethanolamine (DEA) scrubbing (plus caustic soda treatment). To regenerate the 20% DEA solution, heating to 125°C is necessary. The new cold desorption of water used in the new section is estimated to save 75,000 lb./hr. of plant.

It is noted that by the end of 1961 capacity of the Lacq desulphurisation plant will be quadrupled in successive stages. The new water-scrubbing technique will be used in the new expansions.

S.C.I. Overseas Section in Frankfurt

Members Hear Six Papers, Visit B.A.S.F. and Hoechst

MEETING of the Overseas Section, S.C.I. in Frankfurt last week attracted an attendance of about 150, including 100 U.K. members, about 50 German and some U.S. members. Papers were presented by five prominent chemical industry personalities and by Sir Harry Melville, D.S.I.R. secretary.

Programme included the section annual dinner, a reception by the Association of German Chemical Manufacturers and visits to B.A.S.F. and Hoechst. Sir Robert Robinson, S.C.I. president, opened the meeting in the Palmen Garten on 11 June when he introduced the first speaker, Dr. P. Baumann (research director, Chemische Werke Hüls), who spoke on 'The present state of our knowledge of elastomers'.

Dr. Baumann reviewed the present range of synthetic rubbers. Quoting from estimates of the International Rubber Study Group, he said world consumption of all rubbers should total 4.2 million long tons by 1965, of which some 2.3 million would be in synthetic rubbers. Among estimates of 1958 production figures were: styrene-butadiene co-polymers, 1 million tons; butyl, 80,000 tons; nitrile, 40,000 tons.

Montecatini's C-23

One of the new developments mentioned by Dr. Baumann was Montecatini's ethylene-propylene copolymer C-23 (see C.A., 30 May, p. 888). Polymerisation was effected with metal alkyl catalysts according to Zeigler-Natta process. C-23 is to be produced on a large scale in about two years.

World Polythene Production. Consumption of polythene was increasing at the rate of 15-20% per year, said Dr. J. Swallow (chairman, I.C.I. Plastics Division), in his paper on '25 years of polyolefins'.

1958 output of 16 producers of high pressure polythene was 482,000 tons, with capacity estimated at 495,000 tons. By 1959-60 there would be 23 producers and after 1960, 28 producers with a capacity for 852,000 tons. Estimated 1958 capacity of the 13 L.P.-polythene producers was 168,000 tons; by 1959-60 there would be 26 producers and after 1960, 29 firms would have an estimated capacity of 342,000 tons, provided there was no large-scale switch to polypropylene.

The following approximate figures were given for end-uses of polythene: film-sheet, U.S. 40%, U.K. 33%, Japan 50%, Canada 33%. Sweden 30%. Moulding. U.S. 20%. U.K. 30%. Japan 17%, Canada 25%, Sweden 37%.

An increasing proportion of the world's production was being made by the I.C.I. process. Referring to new developments, Dr. Swallow stated that products with a density up to 0.93 or higher were now available in the high pressure product. It had been established that H.P.-polythene could be melt-blended with L.P.-polythene.

Nitrogen Situation. World capacity for nitrogen, was for 1959 estimated by Dr. B. Timm (director, B.A.S.F.), as being 11.2 million tons, of which 9 million tons would go into fertilisers and 1.6 million to technical uses. Surplus would be at least 600,000 tons a year and would be higher still if units operated at full capacity.

Dr. Timm was presenting a paper on the contribution made by the synthesis of ammonia and in introducing him, Mr. Leslie Streatfield, Overseas Section chairman, pointed out that it was at B.A.S.F. 50 years ago this summer that ammonia was first synthesised.

Dr. Timm declared that producers would have to contend with considerable excess capacity for many years. Last year several German companies had cut production and one plant was closed. The economic prospects were not bright. Neither private nor state plans to expand nitrogen production could be encouraged. Best hope was the long-term one to expand world-wide fertiliser usage.

Common Market. In a paper on the Common Market, read for him in his absence through illness, Professor U. Haberland (managing director, Bayer) said cuts in tariffs and quotas were not enough to avoid unbalanced competition and unwarranted integration setbacks. All countries would have to follow mutual regulations; the good offices and authority of an umpire were vital to ensure fair competition. The German chemical industry visualised the extension of the C.M. to all Europe and to be applicable to overseas export connections.

Unco-ordinated Policies of C.M. Countries

C.M. countries feared they might be prejudiced by unco-ordinated trade and economic policies of member countries in a future F.T.A. Products emanating from low-tariff countries having been finished by simple methods from intermediates imported duty free, could be offered at prices below those of similar products from other countries not having those advantages. The higher the level of duties the more reason there was for that fear. The number of production subsidiaries set up in C.M. countries by U.S. firms proved that the level of duties was considered to be high enough to justify such capital investment.

Petrochemicals or Petroleum Chemicals? Why should it be necessary to segregate a section of the chemical industry and give it the ugly title 'petrochemicals' when it was entitled to be identified in its entirety with the chemical industry. That question was posed by Mr. W. F. Mitchell (Shell International Chemical Co.). He pointed out that the chemical companies played a larger part in the development of chemicals from petroleum than did the oil companies, and that future prosperity of the industry must be assessed in terms of chemicals and not of oil.

Mr. Mitchell gave the following comparative annual average growth rates for the U.S. and West Europe over the period 1948 to 1958. Petroleum chemical output: U.S. 14.2%, W. Europe 54.1%; oil refinery intake: U.S. 3.8%, W. Europe 22.0%; chemical production, U.S. 5.8%, W. Europe 10.9%; all industrial production, U.S. 3.8%, W. Europe 7.4%. It was expected that W. Europe production at 2.5 m. tons in 1957 would rise to 7.5 m. tons by the end of 1964. U.S. output, at 14 m. tons by end-1957, was expected to total about 22 m. tons by end-1964.

Work of D.S.I.R. Half of the activities of the National Chemical Laboratory at Teddington are now devoted to methods for the extraction of uranium oxides said Sir Harry Melville, D.S.I.R. secretary. The N.C.L. was now beginning to develop means for the provision of chemical standards to give substances of the highest possible purity for use with the new analytical tools.

After describing the organisation of State scientific research in the U.K., he said it was noteworthy that two of the largest scientifically-based industries—chemicals and petroleum—did not have research associations. Many people wondered why big firms with their own laboratories joined research associations. The most important advantage to them was basic research. When that was done adequately, the large firms could take up the ideas that came from that research and develop them along their own lines.

Annual Dinner. Seventh annual dinner of the section to be held overseas took place on 12 June. Toast of 'The Overseas Section' was proposed by Professor D. M. Balke, Federal German Minister for Atomic Affairs; Mr. Leslie Streatfield, section chairman, responded. Toast of 'The Guests', proposed by Mr. F. H. Braybrook, hon. secretary, was replied to by Sir Christopher Steel, British Ambassador to the Federal Republic.

Drying Oil Companies Merge

A MERGER has been arranged between Stephens and Hynson Ltd., London Road, Barking, Essex, and those interests of Younghusband Barnes and Co. Ltd., Rotherhithe Street, London S.E.16, which have to do with drying oils.

A new company, Younghusband Stephens Ltd., has been formed, with the following directors: Mr. C. W. A. Mundy (chairman). Mr. G. W. Mashford (managing director). Mr. N. E. Bollam, Mr. R. G. Bowring, Mr. G. A. Flanagan and Mr. A. Probart Jones. The secretary is Mr. F. J. Cook.

★ REFERENCE by Dr. J. Swallow (chairman of I.C.I. Plastics Division) in his paper at Frankfurt last week to the commercial melt-blending of high-pressure and low-pressure polythenes was of particular interest. Straight from hearing his paper, members of the S.C.I. Overseas Section were taken to the Ludwigshafen factory of B.A.S.F.

Producers of high-pressure polythene, B.A.S.F. are about to bring a Phillips L.P. unit on stream with a yearly capacity of about 6,000 tons. They aim to make available commercial quantities of melt-blended polythene which they have already proved experimentally. I understand that the B.A.S.F. mix will include about 10% of L.P. material. Similar work has been carried out in this country and in the U.S.

Also of interest at Ludwigshafen were the new contact facilities for sulphuric acid production by a fluidised-bed pyrites process. This factory must have one of the world's largest sulphuric capacities; the new units can produce about 480 tons per day; the older plant is still in production with a daily capacity of about 960 tons.

★ FROM Germany comes news of a new process whereby ethylene is oxidised directly to acetaldehyde. Consortium fuer Elektrochemische Industrie GmbH., of Munich have already got the process to the pilot-plant stage.

Using a palladium dichloride catalyst the process starts in a tower where a rising ethylene-containing gas reacts with a descending 0.1 M aqueous solution of $PdCl_2$ to produce acetaldehyde. Yield is claimed to be over 90%. The liquid containing the reaction products passes to a still where crude acetaldehyde is stripped out. Spent catalyst is regenerated by air oxidation in another tower. Cupric (or ferric) chloride is used to speed up the reaction, $CuCl_2$ serving as oxidising agent for the Pd. The CuCl formed is oxidised to $CuCl_2$ by air.

Claims for this process are low investment and ability to use cheap raw materials. There is also the possibility that the same technique can be used to make acetone from propylene and methyl ethyl ketone from normal butylene economically.

Several companies, I understand, are definitely interested in this process, including some in the U.S. Agents for Consortium in the U.S. and Canada are Hoechst-Uhde International GmbH of New York.

★ THAT challenge of long standing to chemical engineers—the recovery of chlorine from by-product HCl—appears to be conquered. De Nora, the Italian electrolysis experts and Monsanto Chemical, De Nora's U.S. agents, are reported to have a pilot plant operating successfully at Anniston, Alabama, giving economical electrolytic regeneration of chlorine from by-product HCl. It will be recalled that technical or economic failure has attended previous attempts.

I understand that the De Nora electrolysis unit is a filter-press-type assembly of individual cells, each single cell voltage being 2.3. Commercially a unit would be made up of 40 cells (the present Monsanto pilot plant has 35) with an overall voltage drop of 92 v. when passing 1,500 amp. to make 3,900 lb./day of chlorine.

On the economics of the process—estimated investment for a plant to recover 20 tons/day of chlorine is stated to be $400,000, or only $20,000 per daily ton. Power consumption is 1,750 kWh/ton. Based on electricity at 1 cent/kWh and 10% depreciation, estimated recovery cost is put at $36/ton. Solids-free HCl solution of 33% concentration is the electrolyte. It leaves at 18% concentration. Gaseous HCl feed is absorbed in depleted electrolyte to bring it up to strength.

★ AT a time when pollution of the air and rivers is in the news I note with interest the appointment of a director of air and water pollution and control by the Olin Mathieson Chemical Corporation. This is, I believe, the first time they have made such an appointment. Indeed I cannot recall a similar appointment by any chemical manufacturers, in the U.S. or this country, though, of course, all firms have staff to deal with this problem.

Mr. L. W. Roznoy, who has been given the appointment, had been a technical consultant for the Celanese Corporation after a period as a major in the Sanitary Corps of the U.S. Army. He is a graduate of Rutgers University and has a master's degree in sanitary engineering from New York University.

He will advise corporate and division management on air and water pollution activities and act as a consultant with operating divisions on proposed waste control programmes.

★ IN the House of Commons on 11 June the President of the Board of Trade, Sir David Eccles, said 34 formal applications had been received for anti-dumping or countervailing duties under the Customs Duties (Dumping and Subsidies) Act 1957.

Anti-dumping duties had been imposed in two cases. The first, on polymethylsiloxane fluids from a particular firm in France, had been revoked because the dumping had ceased. The second concerned pearl barley. An application that was advertised in respect of lithopone was withdrawn by the applicants and that on piperazine was rejected because a case was not made out.

Of the remaining applications 11 were settled by agreement or rejected for lack of evidence. Fourteen were still under consideration, of which two—in respect of pentaerythritol and tartaric acid—had been advertised.

★ NICKEL which is used in over 3,000 different alloys and in nearly every aspect of modern industry, has yet another role. It has recently been found that this versatile metal contributes colour stability to yellow paint pigments. Of all paints, yellow has been a problem for years particularly used out of doors and exposed to sunlight, heat, moisture and corrosive atmospheres.

The problem has been solved by the Harshaw Chemical Co., Cleveland, Ohio, who are producing two new nickel-containing pigments, Sun Yellow N and Sun Yellow C, enabling yellow paints to retain their colour even in temperatures of over 1,000°F. Combining light fastness with alkali and heat resistance, they are also impervious to acids.

Sun yellows are direct descendants of titanium dioxide pigments developed shortly after the war. The combination of nickel oxide and titanium dioxide produces a light yellow pigment. Besides giving the colour the nickel, which is present to the extent of about 3%, contributes to the pigment's high durability and chemical resistant qualities. With the Sun Yellows the old problem of pigment separation has been solved because each pigment particle is yellow.

★ ESTABLISHMENT of emergency depots throughout the world to make available on short notice a new antibiotic with demonstrated clinical efficacy in the therapy of a number of both superficial and systemic mycotic infections, has been announced recently by Squibb International Division of Olin Mathieson Chemical Corporation.

Called Fungizone (generic term: amphotericin B), investigators report that this antibiotic has proved effective in the following systemic fungus diseases, several of which have, until the discovery of this preparation, been fatal: cryptococcosis (torulosis); coccidioidomycosis; histoplasmosis; South American and North American blastomycosis; aspergillosis; South American leishmaniasis; and disseminated moniliasis.

Fungizone is derived from a previously undescribed species of streptomyces that was isolated by scientists of the Squibb Institute for Medical Research in New Brunswick, U.S. The product is generally administered by intravenous infusion; other parenteral routes may also be used. Fungizone is available as a sterile powder, packaged in vials containing 50 m.g. of amphotericin B activity, for reconstitution in dextrose solution.

I understand that the English emergency depot is at E. R. Squibb and Sons, Edwards Lane, Speke, Liverpool 24.

Alembic

D.C.L. OPEN NEW TECHNICAL SERVICES LABORATORY

FIRST phase of a construction programme on a new site has been completed by the Distillers Co. Ltd. at Mill Lane, Carshalton, Surrey, by the erection of a two-storey laboratory (9,000 sq. ft. floor area) costing £50,000 and housing the company's new technical services facilities, offices, conference room, and library. It is designed so that extension may easily be made both laterally and by addition of another floor.

Opening the new laboratories on Thursday last, Mr. W. Reid, chairman of the Management Committee of D.C.L., said these marked a small but significant addition to the technical resources of the company. The rapid industrial progress today and new requirements and new products called for practical investigational work to be done.

The new unit, which is part of D.C.L.'s research and development group, has a staff of 25 technical personnel, more than half of whom are graduate chemists or physicists. It is organised into groups concerned respectively with the application of solvents in surface coatings, adhesives, textile finishing, etc.; plasticisers in polyvinyl chloride (p.v.c.), cellulose acetate, synthetic rubbers, etc.; monomers in copolymers for plastics, emulsion paints and adhesives; surface active agents in pharmaceutical, cosmetic and industrial emulsions and in detergents; general products in a variety of industrial applications including hydraulic fluids, anti-freeze, jet engine lubricants, lubricant and fuel additives, etc.

Work on Surfactants

Work being carried out in the surfactants laboratory is on emulsion preparations, in particular Renex detergents produced by the Atlas Powder Company, Wilmington, Delaware, U.S., for whom D.C.L. act as agents in the U.K. Investigations include emulsion preparation, evaluation of emulsion stability, and the value of D.C.L. preparations in cosmetics.

In the laboratory investigating solvents, identification of solvents is determined by vapour chromatography and solvent separation by distillation. Other tests are measurement of evaporation rate, use of the conical Mandrel test, flash point determinations using either the Abel apparatus or the Pensky-Marten apparatus. For lacquers, routine viscosity measurements are done using the Ford cup or the Redwood apparatus.

In another section brake fluid formulations are studied for viscosity measurements at −40°C, rubber swelling, boiling point and water absorption. Trubenising with D.C.L.'s Soltex TDX, for which D.C.L. are the sole people in the field, is under investigation from the housewife's side. A glass carburettor is in use for testing anti-icing petrol additives such as Bisolene-II and vinyl acetate emulsion paints and adhesives are being studied with regard to formulation, etc.

Analysis of plasticisers is undertaken in another laboratory after extraction of plasticiser from plastics compositions. The fluorescein test, for instance, specifically identifies phthalates. Plasticiser migration is also studied. Lubricant additives are investigated on behalf of the Arovis Company, a D.C.L. associate company.

E. German Negotiate with I.C.I. for £10 m. Equipment

OFFICIALS of the East German Leuna Chemical Works are to negotiate with I.C.I. on the possible purchase of equipment worth about £10 million. According to Dr. Schirmer, director of the works East German Leuna wish to buy from I.C.I. an ethylene plant, costing between £2 and £3 million. He also reports that the officials will discuss an offer by I.C.I. to provide a high pressure polythene plant costing £7 million.

Tenders for the ethylene plant have also been received from two West German companies but I.C.I. have offered a licence for constructing such plant for all Communist countries, and the West Germans are not prepared to do this.

Monsanto's 10,000 Tons-a-year Polythene Plant in Production at Fawley

NOW in production at Monsanto Chemical Ltd.'s 111-acre site and £3½ million factory unit at Fawley, near Southampton, is the company's polythene plant. Using a high pressure process, this plant is making a range of polythenes at an initial rate of approximately 10,000 tons a year. Production facilities are already being expanded. Raw material for polythene production, ethylene is being obtained from the recently commissioned petrochemicals plant at the adjacent Esso Petroleum refinery by means of a pipeline more than 1¼ miles in length.

Construction of the polythene plant was begun in June 1957 and commissioning started early this year. In addition to the polythene manufacturing plant, there is a versatile 1/200th scale pilot plant reactor system capable of accurately simulating full-scale working conditions. It is planned to use this to extend the range of production by developing specialised materials, and to increase the efficiency of operations. Other buildings on the 15-acre site so far developed provide all necessary ancillary services. These are stated to be adequate for any future expansion of the factory.

The operating force engaged in polythene production, currently in the region of 200, will eventually level off, Monsanto state, at around 250, of whom some 190 will be responsible for production and maintenance.

Monsanto's process. Ethylene, after addition of a catalyst, is compressed in two stages, the second of which brings it to the operating pressure (even at the bottom of the deepest known ocean deep, the Philippines Deep, 35,948 ft., the pressure would still be short of that in everyday use at Fawley). At this stage polymerisation takes place to give polythene. The polythene is purged to remove all traces of ethylene and here and in all subsequent stages of processing filtered air at positive pressure is used to keep the surroundings dust free and the product free from contamination.

Civil engineering. Process, service and research buildings are steel-framed, concrete encased for fire protection where required. Trough-section, smooth-finished aluminium roofing has been employed and steel plate or reinforced concrete suspended floors and roofs are included to meet process requirements.

The civil contract, valued at more than £¾ million included also a sewage sedimentation unit and reinforced concrete outfall to Southampton Water, drainage systems and roads.

Civil engineering consultants were Sir Alexander Gibb and Partners.

Birthday Honours

G.B.E.

Sir William Palmer, for services to industry and commerce. Chairman, European Free Trade Committee, chairman, British Man-Made Fibres Federation.

C.B.E.

R. G. Atkinson, Asst. Comptroller, Patent Office, Board of Trade. B. W. A. Crutchlow, Deputy Chief Insp. of Factories, Min. of Labour. Prof. S. J. Davies, Dean, Royal Military Coll. of Science. A. C. Monkhouse, lately deputy dir., Warren Spring Laboratory, D.S.I.R. E. W. S. Press, dir., Chemical Inspectorate, Min. of Supply. J. A. B. Smith, dir., Hannah Dairy Research Inst.

O.B.E.

Mrs. R. Allcroft, sen. research offr., Min. of Agric. H. Bowley, sen. prin. sci. offr., Nat. Physical Laboratory, D.S.I.R. A. Brewin, sen. prin. sci. offr., Explosives Research and Development Establishment, Min. of Supply. C. A. Jarman, sen. prin. sci. offr., Min. of Defence. A. P. Oliver, prin. examiner, Patent Office, Board of Trade. W. R. A. Taylor, dep. works gen. manager, Capenhurst Works, A.E.A. A. G. Ward, dir. of research, Br. Gelatine and Glue Research Assoc.

M.B.E.

W. H. Bickle, sen. expermntl. offr. D.S.I.R. F. R. I. Gerrard, head, Regional Dept., Nat. Coll. of Food Technology. E. W. Hobbis, sen. expermntl. offr. Long Ashton Agric. Research Station, Bristol. H. Howells, sen. health physicist, Windscale, A.E.A. W. H. Parker, chief chemist, Brit. Sugar Corporation. F. Scholefield, tech. adviser on dyestuffs, Assoc. British Chemical Manufacturers.

Armour Hess European Sales Conference

This photograph, taken at a European sales meeting of the foreign representatives of Armour Hess Chemicals Ltd., in London, shows l. to r. Front row: R. B. Frantz (Armour & Co. Ltd., London), J. L. McCowan (Armour & Co. Ltd., London), N. Hess (managing director), T. D. Lively (Armour & Co. Ltd., London), A. Henderson (chairman), J. W. R. Hudson (director), J. T. Barrie (director), R. G. Muller (Belgium), M. K. Schwitzer (director). Middle row: W. Bernbach (Switzerland), E. Thetman (Finland), J. C. Avenarius (Holland), J. L. Forryan, A. von Saldern (Germany), A. K. H. Fletcher, G. Boeri (Italy), S. Maurel (France), R. J. de Vries, G. Hermann (Austria). Back row: J. D. Hunter, J. Pinto (Portugal), P. Muller (Belgium), R. Bosiers (Armour et Cie, Antwerp), R. C. Fawsitt (Eire), K. Knowlton, M. Armistead, G. Svane (Denmark), W. J. Ayers, G. D. W. Organ (Scotland), V. Timmerman (Germany), F. K. Johnson

Research Associations Should Carry Out Sponsored Research

"WE have no doubt that co-operative research, as fostered by the Department of Scientific and Industrial Research, is of great value to industry and the nation and the Department should continue to give it whole-hearted support." This is the opinion expressed by the Industrial Grants Committee chaired by Sir Walter Drummond, in their report on work done by the industrial research associations in the Government scheme. '*Research for Industry* 1958' (H.M.S.O. 7s 6d (8s by post) $1.35 U.S.A.) The committee add that they are firmly of the view that co-operative research brings "important specific benefits to industry. It economises on money and scientific manpower. It offers a scientific service to firms that cannot afford research departments of their own. It helps to guide industry towards an appreciation of the value of research in general. It facilitates an exchange of technical information and other forms of assistance. Finally, it builds a store of knowledge in which the nation through Government departments can draw."

It is envisaged that in 1959-64, the period of D.S.I.R.'s second five-year plan, the total grant to organisations in the Government scheme will be a third higher than in 1954-59, but that the total grant-earning income will go up by nearly a half. This increase implies a big expansion of research associations already receiving a grant, but at the same time the committee are also allowing for a possible rise in the number of research associations. They point out that nearly one-fifth of net output of British manufacturing industry is not covered properly by existing research facilities and that some of these trades may in the future be appropriately served by grant-aided research bodies.

With regard to activities of research associations, the committee consider it is very important to keep a proper balance between basic research, applied research (including development work) and information, liaison and consultant services. They suggest that the associations should conduct pioneering studies of factory operations and working conditions on a co-operative basis and that wherever appropriate D.S.I.R. should carry out its research in this field and disseminate the results, in close collaboration with the associations. Finally, the committee hold that research associations should be encouraged to do a reasonable amount of sponsored research, so long as co-operative research programmes do not suffer. In future, therefore, a grant-aided association will not be required to consult the committee before undertaking sponsored or repayment projects unless the income arising is likely to exceed 15% of total income in any year, or unless the estimated cost of any one project is over £5,000.

This second annual report on 'Research for Industry 1958' contains besides the Industrial Grant Committee's statement of policy, a review of achievements of the various research associations, two special articles on research topics and a complete catalogue of the research associations, with a note on each.

New gelatine process. British Gelatine and Glue Research Association, the report indicates, has developed a new process for making gelatine and a process for modifying its properties. These processes have been used commercially, although only on a small scale at present.

Separating very fine particles from liquid suspensions is an increasing problem in many branches of industry. Glue and gelatine have a powerful flocculating action, especially under acid conditions, which causes the suspended particles to clump together and so ease filtration or settling.

Durability of rubber products. An outstanding piece of chemical research at the Research Association of British Rubber Manufacturers has increased knowledge of how traces of certain 'poison' metals (notably copper and manganese) which are liable to occur as impurities, can cause premature deterioration of many important classes of rubber products, especially rubber-proofed fabrics (£5 million a year). It has also sought to make clear the mode of action of so-called 'sequestering agents' intended to prevent this.

One of the most technically important results is that these agents must be carefully chosen in relation to the intended use. This is because some sequestering agents can actually make iron, a common impurity, an active promoter of deterioration. As a result of this work chemical manufacturers wishing to develop improved sequestering agents can proceed on a much surer foundation.

Chemical Age and Printing Dispute

Owing to the dispute in the printing trade, this issue of 'Chemical Age' has had to be drastically curtailed. Until a settlement is reached further publication will not be possible, but 'Chemical Age' will be providing a weekly news service for its readers.

H_2S Removal By Gastechnik is Economically Attractive

ESSENTIAL difference between the Gastechnik purification plant and conventional tower purifiers as operated at Cardiff Gas Board is that the cylindrical towers are fitted with special oxide pellets, forming a continuous bed that allows gas to be purified to pass through it at a relatively high velocity with a consequent low back pressure. Main features of the process described by T. Powdrill, at the 96th annual meeting of the Institution of Gas Engineers are: the semi-spherical cylindrical pellets (¼ in. dia.) flow through the towers by gravity; are intermittently charged and discharged without interrupting gas flow, enabling purification to be continuous with reunification *in situ* while the pellets travel through the towers; and final extraction and recovery of the sulphur from the pellets. Main sections of the plant are: purifying towers, with associated pellet-handling equipment; pellet-screening plant; sulphur extraction plant; and pellet-making plan.

Pellet screening and moisture control. To attain smooth pellet flow through the towers, and maintain their maximum reactivity, pellets are screened at each stage of transfer movement. Highly reactive ones are transferred for use in conventional box purifiers. The low cyanogen content of the gas forms a slight outer 'blues' crust which is removed with screenings. To avoid tower blockages, control moisture content of the pellets is required, regular pellet movement has to be maintained through each set of towers.

A near-critical point is reached when pellet movement is controlled to yield a loading of 30%S.

Operating Capacity

Operating capacity. Capacity of the Cardiff plant was rated by the makers to purify 8 mill. cu. ft./day. Operating experience, Mr. Powdrill reports, has proved the optimum loading to be 3 mill. cu. ft./day/set (four sets of towers of 2 mill. cu. ft./day/set). Any one or more sets can be independently operated on overload, pellet movement, however, being increased. This results in a lower sulphur content in the pellets and loss in operating efficiency.

It has been found that S content of a fully oxidised pellet cannot be increased beyond 30%; also the moisture content must be kept below 12%, as above this figure water progressively blocks the pores and confines reaction to the pellet surface. To improve the economics of process, it is necessary to allow the pellets to be recycled to extract the sulphur.

Sulphur extraction. Perchlorethylene (at 121°C) under slight pressure is used as solvent to extract the sulphur from the pellets, since it is non-inflammable, and the vapour non-poisonous. A concentration of 50 p.p.m. in the air is readily detectable by smell (a man could work for 8 hr. in a concentration of up to 200 p.p.m. without danger, Powdrill reports).

Generally, six extractions are required to reduce the pellet sulphur content to between 3 and 5% by weight. Each complete extraction cycle takes 195 min., there being six extractions/cycle. The first 'dewatering' extraction takes 45 min, and the rest 30 min, each. After each of the first four washes pressure in the extractor is allowed to build up to approximately 12 lb./sq. in. gauge to force the hot dissolved sulphur/perchlorethylene solution through a filter and up into the still feed tank, while the liquid from the last two extractions, being low in sulphur content, is fed to the extractor feed tank ready for the next batch of pellets.

Technical control. Temperature of the pellets within the towers is controlled at 100° to 120°F. A continuous control of pellet moisture is verified, and that alkaline conditions are maintained throughout the plant.

Two men are employed on day work (8 a.m. to 5 p.m.) on all pellet movements, lubrication of all gas valves and locks and also on keeping the plant clean and tidy.

Sulphur Analyses

	%
Sulphur	98.0
Inorganic material (oxide)	0.8
Carbon (as bitumen)	0.7
Chlorides	0.1
Arsenic	0.0015

Tarry material derives mainly from the resinous organic material in the new pellets; oxide fines impurities can be reduced only by improved filtration of the sulphur/perchlorethylene solution, it is stated. Experiments are being carried out therefore to find the most suitable grade of nylon cloth for this purpose.

Results. For removing H_2S, the Gastechnik towers have proved to be extremely efficient and reliable, reports Mr. Powdrill, with the added merit of being able to sustain for long periods (two weeks) high overload conditions.

New pellets were fed by canvas shute to the botom of the towers, but excessive pellet breakage occurred and resulted in build up of very high back pressures across the towers (20 in.). Also 50% screening losses were incurred in this period. All future fillings of towers will be made with sulphided pellets as it has been found that fouled pellets are considerably harder and thus less prone to breakage.

Purity of 90 batches of sulphur has varied from 96.5 to 99.5%, but there is every indication that a high order of purity will be maintained (98.5% plus) with the installation of a new-type filler.

Pellet-making plant. Rising costs of transport, handling and bagging charges of manufacturers' pellets have made production of pellets at Cardiff increasingly attractive. The pelleting plant now being erected is made by R. Sizer Ltd., Hull, and is a self-contained unit comprising an elevator for lifting purifying materials to a ¼ in. vibratory screen, with an electro-magnet for removing all particles of ferrous metals, wet and dry mixing kettles, extruding machine, and complete with motors and starters. A prepared oxide, Manox, is used with binders, including such as cement and coarse-boiled plaster.

Cost of Making Pellets

	Shillings
90% Manox at 100s./ton, less 5% rejects (over ¼ in. dia.)	95
10% Coarse-boiled plaster, 2 cwt. at 9s. 6d.	19
Labour (2 ton/day/man)	26
Maintenance, power costs, sundries	21
Depreciation	181
Add contingencies	19
	200

This is £10/ton. Annual saving at Cardiff would be 365 tons at £23 less £10 = £4,745.

Gastechnik Operating Cost

Towers	*Cost/week* £	£	*Cost/ Therm* d.
Labour (2 men—52 hrs. at 4s. 0½d.)	—	21	—
Pellets: 54 tons	—	1,242	—
Electricity	—	13	—
	—	1,276	0.74
Sulphur Recovery (72.7 ton 'sulphur-rich' pellets to be treated)			
Labour	33	—	—
Perchlorethylene loss	41	—	—
Electricity (pumps)	4	—	—
Labour (regular maintenance)	6	—	—
Steam	120	204	0.12
	—	1,480	0.86
Credit			
Pellets recovered: 48.6 ton	1,117	—	—
Sulphur: 17.6 ton at £9/ton	132	1,249	0.73
Less carriage	—	£231	0.13
Net operating cost	—	—	0.13
Depreciation	—	—	0.04
Total cost/therm	—	—	0.17

Basic Data

Normal load: 12 mill. cu.ft./day.
H_2S Content: 350 gr./100 cu. ft.
Perchlorethylene loss: 15 lb./ton pellets handled.

Material Cost

Pellets(ton): £23.
Perchlorethylene (ton): £84.
Steam (1,000 lb.): 95.
Electricity (unit): 1.42.

Simon-Carves to Build Eire Fertiliser Factory

SIMON-CARVES LTD. have been appointed main contractors for the design and construction of the final development of the £2 million Marina Works at Cork for W. & H. M. Goulding Ltd., fertiliser manufacturers.

The contract substantially exceeds £1 million. The Marina Works development comprises a sulphur-burning contact-type sulphuric acid plant (the first in Eire) to produce 70,000 tons a year of 100% sulphuric acid, plants to use the acid in the production of the equivalent of 200,000 tons a year of superphosphates as single and triple superphosphates and compound fertilisers, etc., and the associated handling and storage equipment. This new output will be additional to Goulding's present production.

NOVEL WATER SCRUBBING TECHNIQUE REMOVES ACID GASES FROM LACQ GAS

EXPLORATORY borings have shown, or shown to be probable, that the Lacq gas deposits extend over a much greater geographical area than could reasonably have been supposed in June 1956 J. Fouchier, production and sales manager and M. Vicart, engineer, commercial division of Société Nationale des Pétroles d'Aquitaine, reported at the annual general meeting of the Institution of Gas Engineers. Recoverable reserves are at least 150,000 mill. cu. m.

Output by March this year was 5 mill. cu. m./day of crude gas. During the second half of this year output will reach 10 mill. cu. m./day, and by 1961, an output of 20 cu. m./day of crude gas should be reached.

Capacity of the Lacq works' gas treatment plant will increase proportionately as the number of crude gas-producing wells increases and as the supply grid for the commercial gas produced is extended. This need for a co-ordinated development programme is met by the successive construction of a certain number of sections of the works. The first section which has a treatment capacity of 1 mill. cu. m./day of crude gas has been in operation since May 1957. A second section, with a capacity four times that of the first section, has been in operation since February this year, and the third section is due to start up in the second half of this year; its capacity will be 5 mill. cu. m./day of crude gas. The figure of 20 mill. cu. m./day of crude gas will be reached at the end of 1960 by putting a fourth section, twice as large as the third one, into operation.

From 1961, the Lacq works will produce annually: 4,500 mill. cu. m. of commercial gas (almost pure methane); 1.33 mill. tons sulphur; 260,000 tons liquefiable petroleum gases (butane and propane).

Desulphurisation. After leaving the separating plant where the liquid phase is removed, the gas is desulphurised. In the first section of the works, desulphurisation is based on the affinity of CO_2 and H_2S (weak acids) for ethanolamines (weak bases)—the Girbotol process.

Novel H_2S Removal

In the first section plant, the amine used is diethanolamine (DEA) in 20% solution. In the second section, DEA is replaced by monoethanolamine (also in 20% solution) which is more active.

The main innovation is the use of a new process based on the fact H_2S and CO_2 are much more soluble in water than are methane and higher hydrocarbons. Water washing under pressure lowers the acid gas content of the crude gas from 25% to about 10%. The treatment with amines, which follows, is therefore carried out on a gas containing far less acid gas.

This wet-washing unit was designed and developed by the French company, Société Chimique de la Grande-Paroisse. Advantage of wet-washing, compared with the Girbotol process, lies in substantial saving in steam, since all operations take place at ambient temperature.

For removal of petrol, the first section uses a classical method: absorption at low temperature (−15°C) by a wash oil (a depentanised motor spirit) followed by distillation, which allows separate extraction from the absorption oil of propane, butane and petrol.

The second section, however, uses an original method the principle of which is as follows: desulphurised gas is subjected to successive cooling in cold recuperators, in propane evaporators, and finally in ethane evaporators. The temperature is thus reduced to about −70°C, the pressure having changed from 70 kg./sq. cm. to 45 kg./sq. cm. by expansion. At this temperature and pressure, the fluid entering in the gaseous state, separates into two phases, one liquid, the other gaseous. The gaseous phase consists of the dry gas intended for consumers. The liquid phase is a mixture of ethane, propane, butane and petrol.

Several cascade distillations enable each of these products to be extracted in an almost pure state. A large refrigerating plant, using gas-engine compressors, uses as auxiliary fluids propane for temperatures down to −40°C, then ethane down to −70°C. The production of relatively large quantities of ethane in this plant will be used to manufacture ethylene in an ethane cracking unit, which will be combined with one of the installations for petrol removal by cooling.

Sulphur recovery. A technique derived from the classical Claus process is employed. A certain quantity of H_2S is burnt in a steam generator to form SO_2, using air as oxidising agent. The SO_2/H_2S mixture thus obtained is passed into catalyst chambers charged with bauxite. On contact with the catalyst and at a temperature kept at 220° to 230°C, the following reaction occurs:

$$SO_2 + H_2S \rightarrow 3S + 2H_2O$$

Sulphur obtained in the gaseous state is condensed (heat released by this condensation is used for steam generation) and transported to steam-heated liquid-sulphur pits. Sulphur yield of this plant is 96 to 97%.

Three large works are at present being built near Lacq—an electric power station which will use gas; an aluminium works using electricity from the above-mentioned power station; and a chemical synthesis plant, which will use the gas as fuel and raw material. Daily production capacity of this plant will be 75 tons of acetylene, 220 tons of ammonia, and 100 tons of methanol.

Berkeley Reactor Vessel on Test

DURING the week-end 6-7 June, the first of two reactor pressure vessels at the Berkeley nuclear power station became the biggest pressure vessel in the world to undergo a pneumatic test.

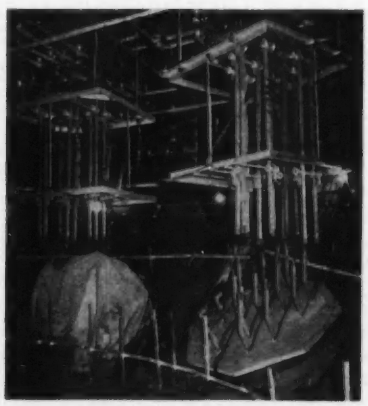
It was also the world's biggest pressure vessel ever to be stress-relieved, a preparatory operation completed a few weeks ago. The vessel is made from mild steel of 3-in. and 4-in thicknesses and weighs 1,000 tons. It is 80 ft. high and 50 ft. in diameter, with an approximate capacity of 142,000 cu. ft.

Engineers of the John Thompson Nuclear Energy Co., partners with A.E.I. in the main contracting company, carried out the test.

All apertures in the 11-ft.-thick concrete biological shielding were closed, ensuring that the vessel was constantly situated in still air and keeping the skin temperature at a constant 75° F.

Pressure testing of the vessel, whose design and working pressures are respectively 137 p.s.i.g. and 125 p.s.i.g., was at 211 p.s.i.g. The compressed air was supplied by four Ingersoll Rand 2-stage compressors, each with a capacity of 375 c.f.m., operating at 200 p.s.i.g. From the compressors the process air was carried to a Tilghman air booster operating at 220 p.s.i.g. and having an output of 900 c.f.m.

In the stress-relieving operation the required temperature range took two days and then the vessel was allowed to soak. Cooling could not be precipitated, so that 14 days passed before the vessel returned to atmospheric temperature.



In the bottom dome section of the reactor vessel, photographed during its preparation for stress-relieving, the main busbar assemblies are seen in the course of erection

E. GERMAN CHEMICAL INDUSTRY FACES DIFFICULTIES BUT PRODUCTION BEATS TARGET IN 1958

"SUCCESSES of the chemical industry of the German Democratic Republic in 1958" by the East Berlin scientist E. Richter are dealt with in the current issue of the East German journal "Chemische Technik." According to Richter output of the country's chemical industry last year was 9.8% above that for 1957; this result, which showed the highest rate of increase since 1953, overtopped the target production for the year by 2.9%.

The greater part of individual targets within the general plan were met last year, though in some cases the delayed bringing into operation of new plants hindered production plans. How production of main chemicals has risen in recent years may be seen from Fig. 1. During last year a total of 650 million Eastmarks (reckoned as Westmarks: some £54¼ million) was invested in new production units and plant. The new capacities resulting are shown in Fig. 2. The chemical industry's exports in 1958 took second place only to the country's machine plant exports. Total exports in 1958 by the chemical industry of East Germany were valued at some 990 million Eastmarks (as Westmarks: about £82½ million). Main exports were calcined soda, synthetic rubber, p.v.c. powder, photographic film, pest destruction media and Wofatite. A continuation of the development activity into this year resulted in production figures for the first two months of 1959 some 9.1% above those for the same period of last year.

After such a bright introduction, however, the article makes it plain that the industry has been labouring under many severe difficulties.

Development in individual spheres of the country's chemical industry was as follows:

Sulphuric acid: Owing to the delay in bringing into operation of new production towers at Salzwedel and Oranienburg, 1958 output was only 1.6% higher than that for the previous year. As a result of this disappointing development, the production of superphosphate had to be cut and emergency sulphuric acid production started at the VEB Farbenfabrik Wolfen gypsum plant.

Soda. Soda production increased on the 1957 figure by 4.2%. Despite "temporary production disturbances", all consumer industries were able to be supplied satisfactorily. This was also the case with caustic soda.

Chlorine. Chlorine is becoming more and more important as a starting product for organic syntheses and production of chlorine and chlorine-based products grows steadily. Difficulties, however, are experienced by East Germany in the production of sufficient liquefied chlorine to meet demands. Electrolytic chlorine production at present covers national demand in its field.

Carbide. A good deal of production expansion work took place in the past year. The country's producers—VEB Chemische Werke Buna, VEB Stickstoffwerk Piesteritz, VEB Elektrochemic Hirschfelde and VEB Lonza—produced 4% more carbide than in 1957. However, it was still impossible last year to put cyanamide capacities to their full use, as not sufficient carbide was available.

Plastics. Expansion in the plastics industry ran according to plan and targets were met, and, in the case of polystyrene and p.v.c. semi-products, passed. Nevertheless, it was impossible to cover the steadily growing demand of the country's plastics-processing industry; far too little polystyrene, for example, was produced, although output was above that planned.

Fig. 1.—Production of Major Chemical Products in Recent Years (in 1,000 tonnes)

Product	1950	1956	1957	1958
Sulphuric acid (SO_3)	245	499	522	531
Caustic soda	150	275	277	296
Soda	103	501	531	553
Methyl alcohol	38	62	63	64
Acetic acid	24	35	40	43
Polystyrene	1.0	2.6	3.3	3.7
P.v.c. powder	22	46	50	55
Synthetic rubber	40	73	75	84
Ammonia (NH_3)	294	417	421	444
Carbide	606	802	799	831
Nitrogen fertilisers (N)	231	300	305	320
Phosphorus fertilisers (P_2O_5)	25	112	129	136
Fuels, total	900	1,805	1,930	2,030
Perlon fibre	0.3	3.6	4.0	4.5
Cellulose	78	98	109	111
Art. silk	9	23	23	25
Wolcrylon fibre	0	0.2	0.6	0.8
Photo film (black/white) (sq. metres)	5,890	8,158	8,363	9,307
Photo film (colour) (sq. metres)	791	3,170	3,224	3,659

Fig. 2.—New Capacities Resulting from 1958 Investment (tonnes per year)

Sulphuric acid	59,000
Calcined soda	10,000
Chlorate	3,000
Pure nitrogen	12,000
Phosphorus fertilisers	1,100
Carbide	22,800
Graphite	4,000
Hydrochloric ether	2,400
p-Kresidin	40
Plant protection concentrate	1,000
Weedkiller	150
"Wofalox"	75
Polyamide	600
"O-glass"	240
Washing media	2,000
Film (black/white)	2,400 sq. metres

A similar shortage of polyamide was experienced. Urea and phenol resins, on the other hand, covered the greater part of the demand for them. Polythene was produced for the first time in East Germany last year, on a semi-commercial scale in an experimental plant. Shortages of chlorine and pure phenol hindered general production, and lack of phenol was responsible for the failure to use phenol resin capacities to the full. Production of synthetic phenol is to be resorted to to fill the gap.

Synthetic rubber. VEB Chemische Werke Buna, the country's main synthetic rubber producer, reported a rise on 1957 production of as much as 12% last year. With the help of its increased carbide output, the plant was able to send up sales both to home and foreign consumers, considerably. In the motor vehicle tyre industry alone, production of synthetic tyres rose by 174,000 units over the year. The Government administrative body VVB Gummi und Asbest is carrying out a programme of increasing production in smaller and medium-sized rubber plants.

Chemical fibres and photographic chemicals. The plants of the VVB Chemiefaser und Fotochemie administrative control body raised output by 10.2% on the previous year's figures. Main stress point was the development of perlon fibres. The plants of VEB Kunstreidenwerk Friedrich Engels, Premnitz, VEB Kunstfaserwerk Wilhelm Pieck, Schwarza, and VEB Filmfabrik AGFA, Wolfen, have a year of concentrated development behind them. 1958 saw the introduction of a completely new type of perlon fibres—the high-quality hollow profile fibre. During the year the caprolactam output of the VEB Lenna-Werke Walter Ulbricht was increased by as much as 15.2% as part of the drive to produce more perlon.

Polyacrylnitrile fibres. Progress was made in the production of the two polyacrylnitrile fibres Prelana and Wolcrylon, although difficulties still exist in connection with the dyeing qualities of the textiles. At the end of last year, Wolcrylon Type 4—with good elasticity—replaced Wolcrylon Type 2 in production.

Lanon. Semi-commercial production of the polyester fibre lanon began last year, and the wool-type synthetic fibre has shown great promise, both in sole use and mixed with other fibres. Large-scale production is to start soon.

Cellulose fibres. Despite the fact that the range of cellulose-based fibres was last year increased by extended production by the Wilhelm Piech and AGFA plants and the VEB Zellstoff-und Zellwollwerk, Wittenberge of curly fibres, much work has yet to be carried out in this field. At present—and this is the case with all types of cellulose fibres—quality is not up to the required standard and lies below international levels. The 'white content' of textile materials produced for these fibres is at present far too low, and the tearability of tyre cords is also causing concern.

Speaking of the major cases of late opening of new production units, the author says that this was due mainly to insufficiently planned investments. He quotes the cases of the urea and dry glue plant at VEB Lenna-Werke Walter Ulbricht, an electrolysis plant for caustic soda with an annual capacity of 10,000 tonnes of NaOH at the VEB Elektrochemisches Kombinat Bitterfeld and the extension of soda plants in Stassfurt.

Work on several really large-scale schemes, which have been under way for a matter of years, continues. Such schemes include the building of a second gypsum-sulphuric acid plant in Coswig, that of a lubricating oil plant in the VEB Mineralölwerk Lützkendorf, the extension of nitrogen production in the VEB Lenna-Werke Walter Ulbricht and film production at AGFA, and the erection of a phosphorus production unit at VEB Stickstoffwerk Piesteritz, a triacetate plant at VEB Chemische Fabrik Finowtal and a salt-coal power station at the "Walter Ulbricht" plant.

Overseas News

ONE-STEP RUBBER MIXING AND DRYING PROCESS SAVES $5-10 PER TON

USING the Flintkote process raw rubber can be mixed and dried in one operation. The process has been announced by the Patent and Licensing Corporation, U.S., wholly owned subsidiary of the Flintkote Co. after undergoing extensive trials at Dasher Rubber and Chemical Co.

Raw rubber material, either natural or synthetic, when precipitated from a latex contains a large amount of water. After pressing 20% of remaining water is removed by steam or air drying. Disadvantages of this method are that particles of raw rubber dry on the outside first but water from the still wet interior seeps in. Also exposure to a large volume of air tends to cause deterioration.

In the Flintkote process, a Farrel-Birmingham Banbury mixer effects dewatering and is stated to eliminate the need for expensive drying and cleaning equipment. Savings of $5.00 to $10 per ton in production of synthetic rubber are claimed.

Drying in the Banbury mixer is accomplished by applying an intense shearing action to the raw rubber. Internal heating above the boiling point of water occurs, resulting in flash off of water as steam. Separate or preliminary pressing is eliminated.

Further, the new process permits simultaneous batching of carbon black, silicates, whiting, oils and other additives settling tank precipitates which are not easily dried by other methods, can also be dried. It has proved highly successful in mixing and drying synthetic rubber such as standard butadiene, polybutadiene and acrylonitrile.

A Banbury 3A has been used for dewatering, etc., to date but use of a larger version the Banbury II, is expected to increase output from 6,000 to 12,000 lb. per hour of dry product. It is now under test.

British Firms Showing at Dutch Fair

The Machevo fair for machinery and equipment for the chemical, food and dairy industries will be held in Utrecht from 12 to 20 October. Its name has been changed from Vochema to Machevo after consultations with organisers of similar events. British firms are among those competing.

Aldehydes May Replace U.S. Tanning Extracts

U.S. Army researchers believe that dependence of the country's heavy leather industry on imported vegetable tanning extracts may be greatly reduced or eliminated by a new and rapid tanning process which uses domestically abundant aldehydes. End-products are said to be indistinguishable from normally tanned leathers. Particular success was noted with formaldehyde, glyoxal and glutaraldehyde.

Japanese Trade with U.S.S.R.

Trade between Japan and the Soviet Union is at present "extremely satisfactory", the Trade Association Japan/Soviet Union and Eastern Europe announced last week in Tokyo. Particularly of interest to the Japanese in this trade was the supply to Russia of chemical plant; since the signing of the 1959 trade agreement in December of last year chemical plant worth $900,000 has already been sold to the Soviet Union by Japan. According to the association, negotiations are at present going on between the two countries for the "large-scale" exports by Japan to Russia of production plant for the synthetic fibre industry.

Caprolactam in Hungary

Hungaria Vegyimüvek chemical works have now taken up production of caprolactam at a rate of 300 tonnes a year. This capacity is to be doubled by the end of next year, and in the course of Hungary's next five-year plan, which begins in 1961, will be quadrupled. A second caprolactam plant is to be built in the near future on the site of the chemical combinat at Borsod. Trade name of the caprolactam produced at the Hungaria Vegyimüvek plant, which was built on the pattern of the East German caprolactam works at Premnitz, is Danulon.

New Toyo Nylon Plant

Toyo Rayon Co. Ltd. of Japan are planning to build, in association with the Japanese Government, a new nylon plant at Okazaki, in western Japan. The present daily nylon capacity of the Toyo company is 50 tons; by October of this year it will have been increased to 60 tons and by the end of March, 1960, to 72½ tons. A further plant, for the production of polyacryl fibre, is at present being built in the Shiga area. Quick progress is said to have been made on the construction of the plant, which will turn out a product for which no trade name has yet been announced.

From Tanning to Tall Oil Distillation

The Landskrona, Sweden, factory of Garvamnes AB Weibull has given up the manufacture of tanning extracts and now purifies and fractionates raw tall oil supplied by sulphate mills. A distillation plant has been installed to yield 3,000 tons of fatty acids for varnishes, 2,500 tons of resin, 5,000 tons of light oils and 1,000 tons of pitch.

Czechs to Supply their own Vitamin C Preparations

A new plant at Olomouc, Czechoslovakia, is to supply the country's entire requirements of vitamin C preparations, hitherto imported. Production trials have started in a recently completed section of the plant.

Euratom Research Institute to Start before End 1959

The Euratom Atomic Research Institute will start activities before the end of the year. The institute's operations will be spread over atomic research stations either already in existence or being erected in West Germany, Italy and Holland. The new West German research laboratories at Carlsruhe will carry out research work in the field of plutonium. Euratom has divided its operations into eight sections: raw materials, applied physics, physical chemistry for reactors, handling of radioactive substances, use of radio-active elements, research into the harmful effects of radio-active rays on humans, equipment of necessary reactors and laboratory and industrial plant, and economic problems in the power production industry.

Pharmaceutical Export Group in Israel

A pharmaceutical export firm which represents 80% of Israel's drug manufacturing capacity has been set up recently. The new company, which unites eight leading makers, will soon commence operations under a joint trade mark.

The reason for this decision is to be found in the fact that Israel's pharmaceutical exports has dropped sharply from about £9,000,000 in 1957 to only £3,000,000 last year and to £36,000 in the first quarter of this year. This drop is attributed to the virtual closing of the Turkish market.

New Alkylate Plant for Imperial Oil

Main contract for construction of Imperial Oil's new $2,175,000 alkylate plant at their Edmonton (Alberta) refinery has gone to Canadian Becktel.

The plant will produce 1,500 barrels of alkylate daily for blending with motor spirit. Work will begin in August, and it is expected that the plant will be ready to operate by next February.

German Firm Markets New Chemicals

The following chemicals have been put on the market by the Ludwigshafen, West Germany, firm of Badische Anilin- und Soda-Fabrik A.G.: 1-ethinyl-1-oxycyclohexane; n-butyl-chloride; 2-chloro-4-toluidine-5-sulfonic acid (sodium salt); 4-toluidine-3-sulphonic acid (sodium salt); 4-acetylaminobenzole-sulphonic acid amide; 4-4'-diaminodiphenylme-

thane; di-2-ethylhexylamine; butyric aldehyde; propionic aldehyde; tetrahydrofurane; and neopentylglycol. Details of the chemical and physical properties and uses of these substances are available from the firm.

U.S. Marketing Ultra-fine Aluminium Powder

The U.S. National Research Corporation has put on the market an ultra-fine aluminium powder with grains of approximately 300Å. The powder is said to be 1,000 times finer than all former types in use, and thus results in greater surface area (75 m^2/g) and greater energy content. It is suitable for use in catalysts, powder-metallurgy and solid rocket fuels. Price is 1 dollar per g. Similar powders of iron, nickel, cobalt, manganese, copper, lead, zinc, gold, silver and alkaline earth metals are to be put on the market.

A product introduced to the market by the United States concern Dow Chemical Co. is butylene oxides S, a mixture of 1.2-butylene oxide, cis-2.3-butylene oxide and trans-2.3-butylene oxide. Its uses are in the fields of polymerisation and polycondensation.

East German Symposium on Silicates

The East German Chemical Society (Chemische Gesellschaft in der Deutschen Demokratischen Republik) is staging, with the East German Academy of Sciences' Institute of Inorganic Chemistry, a symposium on "Silicates with one- and two-value cations," for which it is inviting offers of short papers from foreign scientists.

The symposium, to be held in East Berlin on 1-3 October, will deal with the treatment of chemical and crystallographic problems connected with silicate with one- and two-value cations and their hydrates. The synthesis, properties and constitution of such compounds will be the main aspects discussed.

Holland Location for Caltex's Eastern Hemisphere Research

All research for Caltex U.S.'s establishments in the Eastern Hemisphere is to be carried out in future at the new Caltex Central Laboratory near Rotterdam. This site has been carefully chosen because it stands at the gateway to Western Europe's industrial centre.

Besides the laboratories being a central point for testing fuels and lubricants, they will also be responsible for deciding which types of crude oil will be refined at which of the companies' refineries—Holland, France, Italy, the Lebanon, Spain, Bahrein, Australia, the Philippines, Japan and India. The laboratories were built and equipped at a cost of Fl.7.5 million (£707,500).

Plastics Factories in Dominican Republic

A factory for the manufacture of plastics products has begun production in Santiago de los Caballeros, Dominican Republic. It will make chiefly bags to begin with.

Machinery has been ordered by another firm to equip a factory in Ciudad Trujillo for the manufacture of pipes, sheets, hoses and other plastic goods.

Dutch Firms Form Atomic Energy Consortium

Six leading Dutch firms have decided to form a new company, N.V. Neratoom, for the construction of atomic power stations. They are the Breda Engineering works, Philips N.V., the Rotterdam Dry Dock Co., de Schelde Shipyards, Stork Royal Engine Works and the Werkspoor Engineering Works.

Tunisia Making Some of its Own Drugs

The central organisation for the distribution of drugs to Tunisian hospitals, the Pharmacie Centrale des Hopitaux de Tunisie, has begun making certain pharmaceutical products in its own laboratories. It intends to increase the range of these products, possibly with foreign assistance.

Germans Building Argentine Cellulose Plant

The Argentine Government has granted licences to the West German firm of Heinrich Maler & Co. G.m.b.H., Wiesbaden, to export machines, equipment and spare parts to the Argentine for the building in the Paraná delta area of a bisulphate cellulose plant. Investment involved in the equipment for the plant, which is being erected by the Potosi S.A. concern, is given as $1,100,000.

A new source of chemicals for the Argentine is to be the steelworks plant to be erected at Zapla in the province of Jujuy by the West German firm of Demag, Duisburg, as an extension to the present iron and steel plant there. The plant will use charcoal from eucalyptus wood as its main fuel and will therefore produce such by-products as methyl alcohol, acetone and acetic acid. Further, it is estimated that 30,000 metric tons of phosphate fertilisers will be able to be produced annually by the Thomas process.

Olin Mathieson's Solid Rocket Propellant

An employee of Olin Mathieson Chemical Corporation checks an experimental grain solid propellant made at Olin Mathieson's Ordill plant for the Nike Ajax missile. U.S. Army Ordnance has awarded the corporation's Energy Division a contract to begin study of an advanced solid propellant for the Nike Zeus, the latest missile in the Nike class

Shell's Pernis Glycerine Plant To Be Expanded

Capacity of the synthetic glycerine plant owned by Shell Pernis Chemische Fabrieken N.V., Pernis, near Rotterdam, will be raised to a minimum of 15,000 tons a year. The increased production is expected to become available early in 1960.

The decision to increase the capacity was taken within a year after the plant was put on stream. This unit is the first synthetic glycerine plant outside the U.S., and is part of a large and extensive complex of the company's chemical works at Pernis.

Wet Combustion of Organic Substances with Iodic Acid

WET combustion with iodic acid has been studied by R. M. Dlouhy and T. N. Kleinert, Pulp and Paper Research Institute of Canada, Montreal (*Svensk Papperstidning*, 1959, **62**, No. 3, 72), as a method of characterising the products of aerobic biological processes, in particular lignin break-down products, and as a method of measuring the changes in amount of total carbon in the substrates.

Addition of nitrate affects the combustion factor, whereas addition of ammonium sulphate does not, a conclusion further supported by experiments using pure solutions of ammonium sulphate in distilled water.

Dlouhy anl Kleinert state that it is evident that for the iodic acid wet combustion of biological substrates either (a) a correction for the nitrate addition must be made or (b) the latter should be replaced by ammonium sulphate or ammonium phosphate. The ammonium ion, apparently, is not oxidised during the iodic acid wet combustion.

Since these findings suggested that amino-groups present in amino-acids might be oxidised by the iodic acid, the combustion factor (mol. CO_2/mol O'_2) of *dl*-leucine was determined. Assuming that the amino-group is not oxidised but transformed into ammonium ion, then the theoretical combustion factor would be 0.800. It has been found experimentally that the molecular combustion factor of *dl*-leucine is very close to this theoretical factor and thus appears to verify the assumption made above.

People in the News

● New officers for Association of Public Analysts are: president, Mr. J. G. SHERRATT; vice-president, DR. J. H. HAMENCE; honarary treasurer, R. C. SPALDING; honorary editor, DR. E. C. WOOD; honorary secretary, S. A. LYNE; assistant honorary secretary, D. F. H. BUTTON.

● MR. G. F. CARNELL has been appointed sales manager of polythene, effective immediately for Monsanto Chemicals Ltd. Mr. Carnell joined the company in 1957 to develop Monsanto's interest in the polythene market.

● At the first meeting of Technical Committee 93—Starch of the International Organisation for Standardisation at Bad Meinberg, MISS E. M. CHATT, B.Sc., F.R.I.C., head of the Analytical Department of the British Food Manufacturing Industries Research Association, Leatherhead, and MR. W. KEMPF (Germany) were appointed liaison officers between the committee and the International Commission for Uniform Methods of Sugar Analysis.

● At the annual meeting of the newly-formed Association of Consulting Scientists the following officers were elected: Chairman DR. J. G. DAVIS, honorary treasurer DR. G. W. FERGUSON, honorary secretary MR. W. H. STEVENS, 15 Hawthorne Road, Bromley, Kent; other members of the council—DR. M. BARENT, DR. H. H. CHAMBERS, DR. JULIUS GRANT, DR. J. H. OLIVER, MR. O. W. ROSKILL, MR. F. G. SAREL WHITFIELD.

● SIR DANIEL FENNELLY, C.B., general manager of the National Sulphuric Acid Association, will retire on 30 June. MR. E. P. KEELY will take up a new post of director and DR. D. T. DAVIES, M.Eng., A.M.I.Mech E., will become general manager.

● MR. PATRICK DAVENPORT O'BRIEN is to be the new chairman of Laporte Industries Ltd. in succession to his father, MR. L. P. O.BRIEN (see "People in the News", 13 June). Mr. P. D. O'Brien is at present managing director of the company, which he joined 26 years ago at the age of 19.

● DR. JOHN STUART ANDERSON, F.R.S., professor of inorganic and physical chemistry at the University of Melbourne, has been appointed director of the National Chemical Laboratory, Department of Scientific and Industrial Research, to succeed DR. D. D. PRATT, who is retiring. Dr. Anderson was born in London in 1908 and was on the staff of Imperial College, London, before going to Australia. He is particularly known for his work on solid state chemistry and the chemistry of complex salts. He is expected to take up his new post in October.

● MR. GWILYM HUGHES, Woodland Park, Colwyn Bay, succeeds MR. DONALD HUDSON, Hove, as president of the Pharmaceutical Society of Great Britain and MR. TOM REID, Haslemere, becomes vice-president in succession to Mr. Hughes.

● DR. V. G. COVE has been appointed works manager at the I.C.I. Rocksavage and Randal works, Runcorn, in succession to MR. S. F. GATES. After graduating at Liverpool University, he joined I.C.I. Billingham Division in 1940. He transferred to the General Chemicals Division in 1947 when he was first section manager and later assistant to the works manager at the Gaskell Marsh Works, Widnes.

● MR. J. A. REID, commercial manager, the British Extracting Co., Bromborough, has been appointed commercial director of Price's (Bromborough) Ltd.

● After four years as works manager of I.C.I. Ltd., Rocksavage, Randal and Vulley (Rhydmwyn) works, MR. S. F. GATES has retired. He joined I.C.I. in 1927 after obtaining an honours degree in chemistry at Oxford and worked in several departments of I.C.I. at Western Point, Runcorn, and Liverpool.

● MR. M. L. PFEFFER and MR. A. PFEFFER have been appointed directors of the United Indigo and Chemical Co. Ltd.

● MR. P. D. BLACKMORE has been appointed manager of equipment customers' works department of British Oxygen Gases Ltd., Aston, near Birmingham, in succession to the late Mr. E. O. Stich.

● MR. C. A. B. MALDEN has been appointed joint managing director with Mr. J. G. Cronk of Amber Oils Ltd. He joined the company in 1958 from Stephenson Clarke Ltd. Mr. Malden is a fellow of the Institute of Directors and a director of Finders Services Ltd.

● DR. V. C. EWING, Pressed Steel research fellow at Oxford University, has been appointed lecturer in chemistry at the University College of North Staffordshire from 1 October.

● PROFESSOR R. A. ROBINSON, Ph.D., D.Sc., F.R.I.C., F.N.Z.I.C., Professor of Chemisty, University of Malaya, has been appointed to a similar chair in the newly established Kuala Lumpur division of the university.

● MR. H. H. MULLENS has been appointed a director of Pyrotenax Ltd. in succession to the late Sir Claude Gibb. He has appointed MR. J. BENNETT as his alternate.

Obituary

SIR JOHN NICHOLSON, an original director of Imperial Chemical Industries Ltd. and later deputy chairman and chairman of several subsidiary companies, died on 13 June, aged 79. He was born and educated in Glasgow and worked in calico printing before joining Brunner Mond, of which he became a director and sales manager.

Commercial News

Gas Purification

The board of Gas Purification and Chemical Co. Ltd. do not recommend the offer made by E. V. Industrials Ltd. (CHEMICAL AGE, 13 June).

They state that the group's order book is very good and a net profit of at least £400,000 before tax is indicated for the first ten months of the current year.

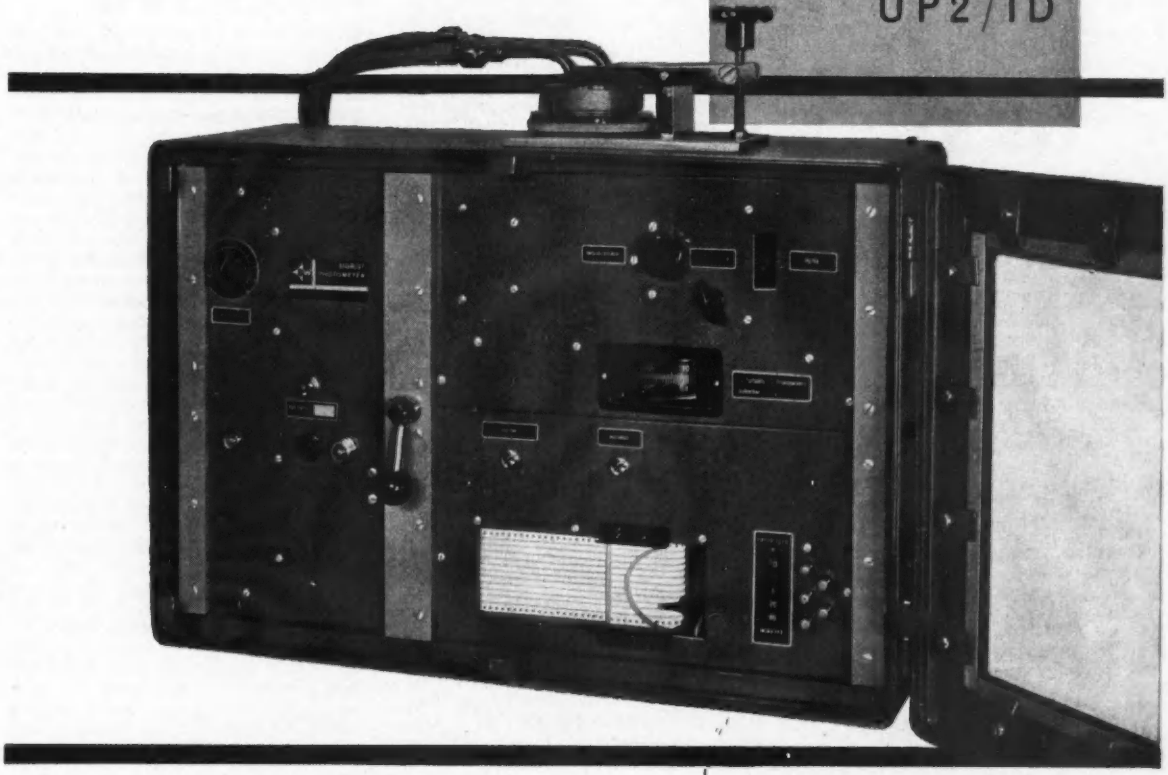
Dunlop Rubber

Over £2¼ million was spent on research and development work during 1958, said Mr. G. E. Beharrell, chairman of the Dunlop Rubber Co. Ltd., at the annual general meeting. Group capital expenditure totalled £13 million of which £9 million was spent overseas.

Mr. Beharrell said the company was giving constant thought to ways in which it might apply to its range of products the growing number of new synthetic materials.

Continuous control of turbidity and absorption in industry

Sigrist Photometer UP2/ID



The Swiss are famous for precision work, some of their products being the best in the world. The Swiss made Sigrist & Weiss Photometer is a fine example, and stands in a class by itself.

This tool takes its rightful place in our range of precision analytical instruments and we are really pleased to have been appointed Sole U.K. Agents for it.

The Sigrist Photometer provides automatic process control by measurement of turbidity or absorption. Among a wide range of applications the following are typical:— continuous control of filtration in water plants, industry and breweries; of separation processes with centrifuges in the food industry; of bacteria cultures (e.g. yeast growth); of decoloration in the sugar industry, oil and margarine industry and chemical industry; and of concentrations by the Lambert-Beer rule.

SPECIFICATION

MEASURING RANGE: For absorption: 366–550 and 550–950 m 29 cm scale graduated in 100% transmission and in logarithmic absorbance 0–1.5. For nephelometry: 2×10^{-6}–6×10^{-2} absolute units.
SENSITIVITY & REPRODUCTIBILITY: 0.5% of the scale for transmission and turbidity, 2% for absorbance.
FLOW TYPE CELLS: Made of stainless steel or coated brass. Light path: 0.5; 1; 2; 3; 10 or 30 mm.
NEPHELOMETRIC COMPARISON STANDARDS: For determination of measuring range:
0–2×10^{-3}; 0–6×10^{-3};
0–2×10^{-2}; 0–6×10^{-2}
absolute units.
STEEL CASE—SEALED, GALVANISED & VARNISHED: Also available: UP3 with external light path and UP2/ID with monochromator for laboratory use.

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TRADE NOTES

Automatic Conductivity Measurement

A new range of Philips automatic conductivity measurement equipment permitting continuous measuring recording and control of the strengths of process solutions is now being distributed in the U.K. by Research and Control Instruments Ltd., 207 King's Cross Road, London W.C.1. The equipment is made in Holland by N.V. Philips Gloeilampenfabrieken. Two methods are available: with automatic temperature compensation, or by the use of a reference cell immersed in the liquid being examined, in which case no temperature compensation is required. With single channel recorders, a control facility is possible whereby the strength of the process liquid may be continuously controlled, in addition to being measured and recorded.

Plastics for Chemical Plant

The use of rigid p.v.c. for chemical plant construction and protection is outlined in a leaflet issued by Tanks and Linings Ltd., Town Wharf, Droitwich, Worcs. Using sheets and extruded sections such as rod, tube and angle, they point out, p.v.c. can be fabricated into an infinite variety of shapes to provide such fixtures as fume ducting, fans, tanks, scrubbing towers, pickling baskets, plating barrels, piping, valves and fume cupboards. Nutravic lightly plasticised p.v.c. is suitable for lining chemical plant.

Change of Address

Matthews and Yates Ltd., manufacturers of Cyclone fans and fan equipment, have transferred their Birmingham office to larger premises at Smithfield House, Digbeth, Birmingham, 5. Tel. Midland 7284.

Agents for Catalyst

Houdry Process Corporation, Philadelphia, have appointed Lindeteves-Jacoberg, N.V., of The Hague as representatives in the U.K., Belgium, Netherlands, Luxembourg and the Union of South Africa for Dabco (triethelynediamine) a new one-step polyether catalyst used in producing urethane foams and elastomers.

Fisons Cut Fertiliser Prices

Substantial reductions have been made by Fisons Ltd. in their compound fertiliser prices, following the opening of their new ammonium nitrate plant at Stanford-le-Hope, Essex. Prices of Fisons 40 range compounds are reduced by an average of 20s per ton for the season beginning 1 July. Other compounds on average come down in price by over 15s per ton.

Marketing Specialised Solvents

Shell-Mex and B.P. Ltd. and Shell Chemical Co. Ltd. jointly announce that from 1 July, 1959, Shell Chemical Co. Ltd. will be taking over the marketing of certain specialised hydrocarbon solvents from Shell-Mex and B.P. Ltd. The products involved are the aromatic solvents Octaro and Reference X7, and the odourless aliphatic solvent Shellsol.

Shell-Mex and B.P. Ltd. will continue to supply the hydrocarbon solvents—white spirits, distillate, special boiling point spirits and rubber solvent.

No Change in Nitrogen Position, Say Aikman

LITTLE has occurred, states the half-yearly nitrogen report of Aikman (London) Ltd., to necessitate any great change in their previous estimates of production and consumption. For 1958-59 estimated production figures have slightly decreased owing to curtailment in Europe.

Figures for consumption in Europe and the U.S. have been increased as consumption in Europe during 1958-59 was 6% higher than the previous year, and in the U.S., at least 8% higher. World production and consumption continue to increase at a satisfactory and uniform rate and there is no reason to believe, Aikman state that the situation will change in the forseeable future.

In Europe, ammonium sulphate stocks are normal, but there is probably some overproduction of calcium ammonium nitrate and ammonium sulphate nitrate. The U.S. stock position is healthy due to the satisfactory increase in home consumption, but there is little available for export. Stocks in Japan, due to loss of exports to China are considered to be causing concern.

Lower prices now ruling are felt to "reflect a state of nervousness in the future which we (Aikman) ourselves do not share", competitive sales of calcium ammonium nitrate and ammonium sulphate nitrate from European producers are considered as having caused lowering in price for these products, which in turn has resulted in lower prices of ammonium sulphate. "Prices are now at a level where further curtailment of production must be in the minls of producers". Aikman believe, however, that when a little confidence is restored, prices might rebound quite quickly.

Examples quoted of falls in price are: ammonium sulphate in bulk to Spain $40.47 f.o.b., in December and $37.00 in April; in Greece, ammonium sulphate in bags, $46.25 c.i.f. last season, but $42.40 in February.

Japan as indicated in Aikman's December report received 80% of nitrogen awards (urea $94.60, ammonium nitrate $66.59 and ammonium sulphate at $41.85 f.o.b. in bags). An OSBROK tender worth $2,950,000 for shipment September/December 1959, is likely to be obtained by Japan.

In China large sales of ammonium sulphate have been concluded at prices a little under £14 in bags f.o.b. and calcium ammonium nitrate at under £13. China is considered as likely to develop as an important consuming country, consumption increasing at a far higher rate than new production plants in China can fulfil. Imports by China are seen as being limited only by amounts of foreign currency available for purchase of fertilisers.

Russia Lists Chemical Plant for Possible Purchase from U.K.

THE Soviet Delegation, during the course of the negotiations in Moscow in May last which resulted in the Five-Year Trade Agreement provided a list of machinery and equipment for possible import from the U.K. in the period 1960-64. Value placed by the U.S.S.R. on the listed equipment is approximately 4-4.5 billion roubles (£350-£400 million). In addition, the delegation stated that the Soviet Union could also purchase in the U.K. during the same five-year period industrial goods and raw materials to an approximate value of 3 to 3.5 billion roubles (£276-£300 million), including chemicals and pipes for gas pipelines as well as raw materials usually purchased by the Soviet Union from British companies.

It was made clear by the Soviet delegation that implementation of this programme would depend on the Soviet Union having adequate resources of foreign exchange.

Export Services Branch, Board of Trade, Special Register Information Service have issued the list in the form it was received from the U.S.S.R. Placing of contracts for the listed equipment depends on the usual commercial considerations of price, technical performance, delivery dates, etc. Contracts have already been placed for some of the items listed.

Plant	Capacity (tons)	Units
Polyacrylonitrile fibre, etc.	15,000/year	1
High tenacity rayon type cord fibre	50/24 hrs.	1
'AH' salt	—	1
Helium from natural gases	—	1
Chemical treatment of germanium	—	2
Continuous polymerisation of caprolactam	12/24 hrs.	1
Recovery and regeneration carbon disulphide	70/24 hrs.	1
Polyester resins for glass plastics	5,000/year	1
Copolymers of styrene	5,000/year	1
Tripolyphosphate	—	1
Pyrophors	—	1
Acetate silk	5,100/year	1
Actuated black from liquid raw materials	—	1
Syn. fatty alcohols	5,000/year	2
Alkylamides of syn. fatty acids	5,000/year	1
Styrene and polystyrene	20,000/year	1
Continuous production phenol-formaldehyde resins	30,000/year	1
Glass plastics plates and resins	20,000/year	1
'AH' salt and Nylon-66	10,000/year	1
Acetate staple	20,000/year	1
Polychlorvinyl resin	35,000-40,000/year	1
Plastics and glass-plastics pipes	20,000/year	1
Styrpore	10,000/year	1
Tetrafluoroethylene	3,000/year	1
Syn. glycerine	20,000/year	1
Ethylene urea	1,000/year	1

The Board of Trade state that the list is intended as a general guide to U.K. companies who may be interested in trading with the Soviet. There is no implication, however, that export licences will be granted in respect of equipment which is subject to the embargo on the export of goods of strategic significance to the Sino-Soviet Bloc.

Other equipment required is as follows: Equipment for production of articles from synthetic materials (polythene, polychlorvinyl, etc.) 100 million roubles worth; spinning, weaving and finishing equipment for production of articles of synthetic fibres 80-100 million roubles; miscellaneous chemical equipment 100 million roubles; equipment including control and measuring instruments, instruments for automation of technological processes, etc., 90-100 million roubles; pumps and compressors of various types, 90-100 million roubles; valves of large parameters and acid-proof valves complete with automatic control system, 40-50 million roubles.

Chemical Industry Hopes for Good Year

AFTER the mild relapse in trade in 1958, the heavy chemical industry now has hopes for a good year, Mr. H. Smith, chairman of the I.C.I. General Chemicals Division, told 60 long-service employees of Castner-Kellner works, Runcorn, at a presentation of awards for service ranging from 20 to 50 years.

Mr. Smith said: "The improvement in trade is such that some of our more pressing worries have been removed."

A company like I.C.I. must have a good deal of money behind it and the people putting up that money must have confidence in the borrower. Size was not necessarily the same thing as strength.

NEW PATENTS

By permission of the Controller, HM Stationery Office, the following extracts are reproduced from the 'Official Journal (Patents)', which is available from the Patent Office (Sales Branch), 25 Southampton Buildings, Chancery Lane, London W.C.2, price 3s 6d including postage; annual subscription £8 2s.

Specifications filed in connection with the acceptances in the following list will be open to public inspection on the dates shown. Opposition to the grant of a patent on any of the applications listed may be lodged by filing patents form 12 at any time within the prescribed period.

AMENDED SPECIFICATIONS

On sale 15 July

Epoxide compounds. Henkel & Cie G.m.b.H. **766 771**

Penicillin salts. Imperial Chemical Industries Ltd. **795 934**

Kiln furniture. Woolliscroft George & Son Ltd. **796 898**

ACCEPTANCES

Open to public inspection 22 July

Production of thermoplastic polymeric materials. Imperial Chemical Industries. **817 141**

Production of polychlorotrifluoroethylene filaments. Union Carbide Corp. **816 987**

Process for shedding and pre-ripening alkali cellulose. Spinnfaser A.G. **816 929**

Method of treating synthetic fibres. Goodrich Co., B. F. **816 869**

Preparation of polysiloxanes. Monsanto Chemicals Ltd. **817 105**

Production of benzene carboxylic acids. Newby, H. (Chemische Werke Hüls A.G.). **816 800**

Treatment of germanium-containing materials. American Smelting & Refining Co. **817 080**

Vinyl chloride polymer compositions. Imperial Chemical Industries Ltd. **817 041**

Preparing acrylonitrile containing fibres. Dow Chemical Co. **816 841**

Recovery of selenium from scrap selenium rectifiers. American Smelting & Refining Co. **816 989**

Bleaching and disinfecting compositions. Purex Corp. Ltd. **816 882**

Preparation of 2, 2¹-methylene-bis-(4, 6-dialkyl phenols). American Cyanamid Co. **816 913**

Production of aromatic amines. Imperial Chemical Industries Ltd. **817 142**

Containers for fluent material. Stockholms Superfosfat Fabriks A.B. **817 160**

Veterinary compositions containing cyanoethydrazide. Imperial Chemical Industries Ltd. **817 143**

Recovery of unsymmetrical dimethylhydrazine from aqueous solutions by distillation. Olin Mathieson Chemical Corp. **817 111**

Dyestuffs of the benzene-monoazo-naphthaline series and metal derivatives thereof. **816 901**

Emulsifier and emulsifiable concentrate. Atlas Powder Co. **816 915**

Electrodeposition of tin on aluminium. Amp Inc **817 144**

Preparation of macromolecular polymethylene terephthalates Onderzoekingsinstituut Research N.V. **816 801**

Process for producing polyethylenes having substantially uniform physico-chemical properties. Houilleres du Bassin du Nord et du Pas de Calais. **817 145**

Removal of hydrogen sulphide from gases British Petroleum Co. Ltd., and Meyer, P. **817 114**

Derivatives of hexahydro-benzylic acid and pharmaceutical preparations containing them. Koninklijke Pharmaceutische Fabrieken Voorheen Brocadesstheeman & Pharmacia N.V. **816 804**

Radiation detectors. Distillers Co. Ltd. (Addition to 786 516.) **816 849**

Preparation of bifunctional cyclohexanes. Esso Research & Engineering Co. **816 993**

5-Nitro-2-furaldehyde hydrazone, its preparation and veterinary compositions containing it. Imperial Chemical Industries Ltd. **816 886**

Polyfunctional surface-active agents. D'innovations Chimiques Dite: Sinnova Ou Sadic. S.A. **816 888**

Process and compositions for the electrodeposition of copper. Du Pont de Nemours & Co., E. I. **817 037**

Process and apparatus for the detection of escaping gases. Paumier, J. A., and Terrasson, P. E. **817 146**

Production of 2:4:6-trimethylpyridine. Distillers Co. Ltd. **817 038**

Method and apparatus for the production of gusseted tubing. Union Carbide Corporation formerly Union Carbide & Carbon Corporation. **817 020**

Manufacture of clad fuel element. Atomic Energy of Canada Ltd. **816 919**

Dehydrogenation of olefines. Polymer Corp. **817 117**

Device for dividing plastic masses into equal parts. Kooperativa Förbundet Ekonomisk Förening. **817 023**

Benzthiazolylsulphonamides and their use as vulcanisation accelerators. Imperial Chemical Industries Ltd **817 039**

Benzoxazinediones and process for preparation. U.S. Vitamin Corp. **817 147**

Method of producing organosilicon compounds. Kali-Chemie A.G. (Addition to 756 612.) **816 996**

Purification of terephthalic acid. Imperial Chemical Industries Ltd. **816 892**

Synthesis of pyridine and 3-picoline Reilly Tar & Chemical Corp. **816 973**

Hydrolysis of organo-fluorosiloxanes. Kali-Chemie A.G. **817 040**

Processes and apparatus for sorting granular materials. Spodig, H. **816 974**

Means for heating the contents of glass containers by steam. Zeiss-Stiftung C., (trading as Jenaer Glaswerk Schott & Gen.). **816 894**

Apparatus for analysing a liquid for determining presence therein of carbon dioxide or other substance capable of being liberated in gaseous form. Technicon International Ltd. **816 815**

Process for refining metals in a rotary drum furnace. Hüttenwerke Oberhausen A.G. **816 977**

Production of a bright surface on zirconium, titanium and their alloys. Amchem Products Inc. **817 123**

Incorporating additives into polymeric products. Dow Chemical Co. **817 124**

Production of acetylene by pyrolysis. Dow Chemical Co. **816 816**

Elongated articles formed from polypropylene. Montecatini Soc. Generale Per L'Industria Mineraria e Chimica. **817 125**

Methods of operating fluidised bed apparatus. Bataafsche Petroleum Maatschappij N.V., De. **816 899**

Production of oxygenated compounds. Union Carbide Corp. **817 148**

Isomerisation process and preparation of feed stream therefor. Esso Research & Engineering Co. **817 126**

Air filters. Trützschler, H., and Trützschler, H. **817 030**

Purification of acetone. Phenolchemie G.m.b.H. **817 149**

Manufacture and treatment of porous rubber and like materials. Hairlok Co. Ltd. (Divided out of 816 853.) **816 854**

Catalytic conversion of hydrocarbons or hydrocarbon mixtures. Bataafsche Petroleum Maatschappij N.V., De. **817 127**

Compounds of the pregnane series. Soc. Des Usines Chimiques Rhonepoulenc. **817 129**

Preparation of nitro derivatives Du Pont de Nemours & Co., E. I. **817 150**

Germicidal soaps. Farbenfabriken Bayer A.G. **817 130**

Veterinary compositions containing 4-bromo-4¹-nitrocarbanilide. Imperial Chemical Industries Ltd. (Divided out of 816 855.) **816 856**

Production of esters of beta-substituted glycidic acid. Chemische Werke Hüls A.G. **817 000**

Preparation of α-saturated aldehydes Hoffmann-la Roche & Co A.G., F. **816 819**

Open to public inspection 29 July

Preparation of perfluorodienes. Haszeldine, R. N. **817 320**

Removal of trace metals from hard or saline waters or from aqueous solutions of electrolytes. Evans & Rais Ltd., N. **817 540**

Coating of metal with a second metal. British Iron & Steel Research Assoc. **817 209**

Ionisation chambers. Cole Ltd., E. K., and Davis, R. G. **817 481**

Solid synthetic resin material and method of its manufacture. Moser-Glaser & Co. A.G. **817 362**

Nor-steroids and preparation thereof. Ciba Ltd. **817 351**

Piperidines and process for their manufacture. Ciba Ltd. **817 353**

Aromatic and heterocyclic carboxylic esters. Distillers Co. Ltd. **817 372**

Therapeutic compositions containing a protease. Innerfield, I. **817 329**

Production of trichlorobenzoic acid and product obtained. Heyden Newport Chemical Corp. **817 173**

Benzothiazole-monoazo-isonicotinic acid compounds and materials coloured therewith. Eastman Kodak Co. **817 374**

Apparatus for indicating the density of liquid flowing through a pipe: Hobson Ltd., H. M., and Mott, L. F. **817 280**

Control of chemical plant. Simon-Carves Ltd. **817 375**

Treated flexible glass structures and methods for treating flexible glass structures to improve the bonding relation with resins. Owens-Corning Fibreglass Corp. **817 463**

Diamine salts of N-substituted trymethylene diamine-N³alkonic acids. Armour & Co. **817 261**

Fuel oil compositions. Armour & Co. **817 262**

Analytical testing of liquids. Fuhrmann, H. **817 474**

Process for preparing continuous plastic sheets. Swedlow Plastics Co. **817 343**

Filter presses. Geigy A.G., J. R. **817 485**

Process for preventing the accumulation of electrostatic charges on synthetic fibres composed of polyamides or of polyethylene terephthalate. Imperial Chemical Industries Ltd., Batty, J. W., Henshall, A. E. and Sagar, H. **817 355**

Acetoacetanilides, their production and acaricides produced therefrom. Cilag Ltd. **817 356**

Fluid-pressure warning device. British Oxygen Co. Ltd. **817 289**

Cyclopentanopolyhydrophenanthrene compounds. Laboratories Francais de Chimiotherapie. **817 175**

Stabilisation of unsaturated linear polyesters. Rohm & Haas Co. **817 554**

Process of producing volatile products from residual oils. Esso Research & Engineering Co. **817 333**

Cyclopentanophenanthrene compounds. Laboratories Francais de Chimiotherapie. **817 176**

Process and apparatus for determining filtration characteristics of spinning solutions under operating conditions. Spinnfaser A.G. **817 376**

PILKINGTON'S OPEN NEW £100,000 LAB. WING

DOUBLING the existing floor space, an extension to the Central Analytical Laboratory of Pilkington Brothers Ltd., at Eccleston Grange, near St. Helens, Lancs, completes a unit which is the largest and most up-to-date of its kind in the world's glass industry.

The new wing, built at a cost of £100,000, adds 8,700 sq. ft. to the existing 8,000 sq. ft. Laboratory bench space is increased from 570 ft. to 1,300 ft.

It houses equipment of the latest type, including a £17,000 spectrometer which is only one of three in use in Britain today. This instrument, designed and produced by a British firm, incorporates electronic recording equipment and is capable of giving analytical results within a matter of minutes, which once took several days to complete.

The complete laboratory is responsible for almost all the analytical work within the Pilkington Group, which includes plants in many parts of the world. Some 22,000 samples are checked in the laboratory a year.

The two-storey extension is built as a wing to the existing building. It is 133 ft. long by 46½ ft. wide, and incorporates a fan house for air conditioning and fume extraction. The wing has 17 laboratories of varying size, with offices, a statistics section, stores, kitchen, dining room to house 45 people, and cloakrooms.

The west elevation is glazed with plate glass but the east side is glazed with Insulight double glazing units to provide maximum heat insulation where temperature control is important.

The ground floor includes a large spectrographic block which is equipped with instrument laboratories; sample preparation and dark room; furnace room; spectrographic electrode preparation; offices; statistics and records; cloakrooms; dining room; kitchen and additional stores accommodation.

In addition to three chemical laboratories housed within the first floor there are also microscope and grinding and polishing laboratories; physics laboratory; balance and furnace rooms, flame photometer laboratory and an information section.

The work carried out at the Central Analytical Laboratory involves regular analysis of all raw materials and finished glasses. Nearly all the firm's products are analysed once or twice a week. Sometimes this check takes place daily.

Raw materials for the manufacture of glasses produced by Pilkington Brothers are received from many parts of the world, and these are subject to constant supervision to see that they are suitable.

Apart from analyses carried out on materials directly concerned with glass-making the laboratory also carries out tests for atmosphere pollution stations around St. Helens. It also checks all effluents to comply with rivers board regulations, and a wide variety of other analyses include those on paper, asbestos, cements, metals and deposits of varying types.

The development of spectrographic techniques has been the most noteworthy among the firm's investigations into new methods which may be applied to their own problems of analysis. Samples ranging from faults in glass no bigger than a pin-point to those representing 1,000 tons of sand are dealt with by this method. Flame photometery is used for the day-to-day control of alkali content of glasses and raw materials.

Bubble analysis is another problem handled there. The composition of gas contained in them is discovered to eliminate the source. Bubbles no bigger than a pin head are analysed often for this purpose.

The Central Analytical Laboratory has a staff of 90, of whom 70 are experimental workers. Mr. Frank Hartley, chief analytical chemist, is in charge.

Exemptions From Import Duty

The Treasury have made the Import Duties (General) (No. 6) Order, 1959, exempting the calcium silicide, calcium-silicon and two related products referred to in the order from import duty under the Import Duties Act, 1958. The order came into operation on 15 June.

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PATENTS

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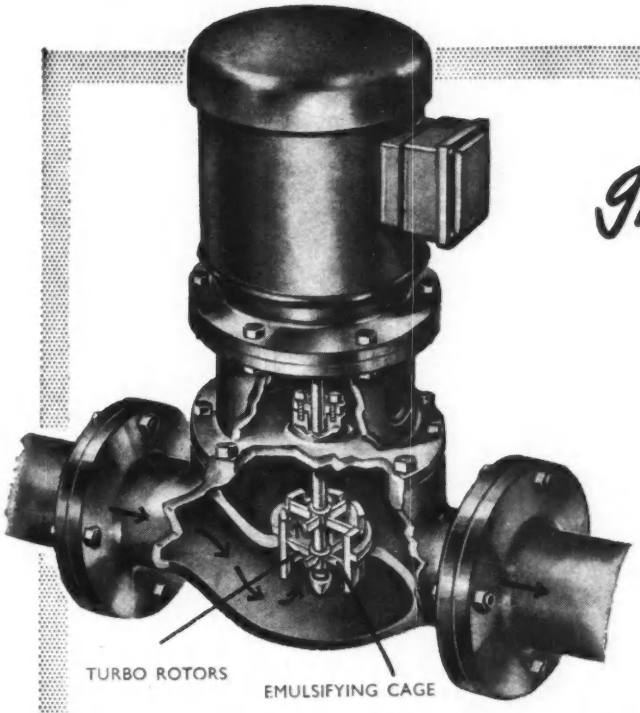

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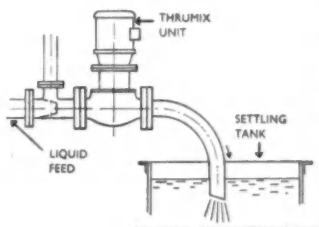
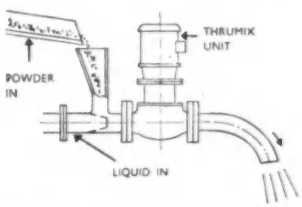


Two or more Liquids continuously mixed. This arrangement is used where 'Washing' of a liquor is necessary with subsequent settling.



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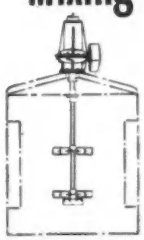

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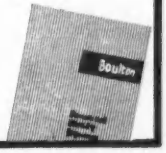

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